بسم الله الرحمن الرحيم
اتحاد طلاب طب عين شمس بالتعاون مع فريق
ملزمة امتحانات الفرقة الثانية يقدمن
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Head

1. Mention Significance of bregma (Skull Cap) in skull.
2. Give an account on the scalp.
3. Give an account on Muscles of the scalp and their nerve supply.
4. Give an account on Venous drainage of the face & scalp including its surgical significance.
5. Describe venous drainage of face & its applied anatomy. (May 2009)
6. Mention Arteries behind the ear in the scalp.
7. Mention Sensory innervations of external nose
8. Give an account on: Lateral wall of nose. (88,91)
9. Give an account on Layers of scalp and its nerve supply (September 2004)
10. Mention: Termination of retromandibular vein (posterior facial) (September 2004)
11. Give an account on Nerve supply of the face (September 2005, 2007)
12. Give the course & distribution of the facial nerve after its exit from the skull, Comment on its injury at that site . (May 2008)
13. Give an account on Branches of facial artery in the face.
14. Give an account on Facial nerve . (89)
15. muscles of mastication (origin,insertion,nerve supply,action) (May 2001)
16. Give an account on Lateral pterygoid muscle. (90)
17. Give an account on Muscles of mastication . (September 2002)
18. The anatomy and content of parotid gland. (79,94)
21. Give an account on The emissary veins and their surgical significance. (80,88
22. Give an account on cavernous sinus (site, tributaries, communications, drainage & its applied anatomy). (78,79,80,84,93,97,Sep 2000,May 2006)
23. Give the anatomy of pituitary gland (position, relations, blood supply, & development) (May 2004)
25. Give an account on Short ciliary nerves. (90)
27. Give an account on Course & distribution of the maxillary division of the trigeminal nerve.
29. Give an account on Maxillary artery origin, termination, course, relations and branches . (89,92,May 1998)
30. Give an account on muscles of tongue. ( May2000)
31. Give an account on Hyoglossus muscle (attachment , nerve supply , action & relation) . (September 2007)
32. Give an account on nerve supply of tongue. (September 2001 & May 2002)
33. Give an account on Lymphatic drainage of tip of tongue.            (90,97)
34. Give an account on the nerve supply, mucous membrane and muscles of:
   a) tongue
   b) larynx
35. Nerve supply and action of the following muscles: Digastric muscle, temporalis muscle, geniohyoid muscle, cricothyroid muscle. (September 2004)
36. Describe action & nerve supply of the following muscles: hyoglossus, lateral pterygoid, inferior oblique of eyeball, and (September 2008)
37. Give the origin, insertion, nerve supply & action of the following FIVE muscles: Genioglossus, buccinator, sternocleidomastoid, medial pterygoid & tensor palate. (September 2008)
38. (Case): A 5 years old child fell off his bicycle and his head hit the pavement. A 2 cm long wound in his scalp was seen, but soon he was sitting in a pool of blood.
   a) Why does a scalp wound bleed profusely? (1 mark)
   b) How can u stop the bleeding if u r away from a hospital? (0.5 Mark)
   c) Name arteries supplying the scalp? (2.5 Marks)
   d) Which is the dangerous layer of the scalp? Why is it dangerous? (1 Mark) (May 2008)
39. (Case) (5 marks): A young man, while sucking a piece of lemon, noticed painful swelling below the mandible with a small nodule related to the swelling. Examination revealed a stone in the right submandibular duct.
   a) Where does the duct open in the mouth? (1 mark)
   b) Which nerve is intimately related to the duct? (1 mark)
   c) What is the nerve supply of the submandibular gland? (2 marks)
   d) Name structure related to lateral surface of the superficial part of the gland (1 mark) (May 2010)
40. (Case) (3 marks): A 20 year old student was playing baseball when the ball hit him on the side of the head. He immediately fell to the ground unconsciousness, but after about 30 seconds he felt well and decided to sit and watch the match. An hour later, he felt so sleepy then he became unconscious. He was taken to the hospital. A skull X-ray showed a fracture in the region of the pterion.
   a) Define the pterion (1 mark)
   b) Why are fractures in this region extremely dangerous? (2 marks) (May 2010)
41. (Case): During surgical removal of a tumor in the infratemporal fossa, an intense hemorrhage occurred. The surgeon clamped the main source of arterial supply to the area.
   a) Define the pterion (1 mark)
   b) Why are fractures in this region extremely dangerous? (2 marks) (May 2010)
42. (Case):
tongue after the operation. Can you account for this? Name the nucleus that receives taste sensation
(2011)

**The answer:**
1. The main arterial supply is the maxillary artery. (1 mark)
2. The main nerve is the mandibular nerve (5 marks)
   Branches:
   From the trunk: Nervus spinosus, nerve to medial pterygoid which supplies medial pterygoid, tensor palate and tensor tympani.
   From anterior division: buccal nerve, nerve to lateral pterygoid, nerve to masseter and nerve to temporalis.
   From posterior division: auriculotemporal nerve, lingual nerve and inferior alveolar nerve
3. Loss of taste sensation due to affection of chorda tympani which joins lingual n.
   The nucleus that receives taste sensation is the nucleus solitarius. (2 marks)

42. **(Case):**
A patient opened his mouth widely while yawning, after which he could not close his mouth. (5 Marks)
1. Name the joint affected and its type. (2 Marks)
2. List ligaments of the joint. Which ligament is important functionally? (1 mark)
3. Mention the nerve supply of the joint (June 2012)

43. **(Case):**
A patient developed a benging swelling of the parotid glad (superficial lobe) the doctor decided to excise it. (5 marks)
1. what is the most important structure that would the doctor take care of? (1 mark)
2. Mention the distribution of its upper two branches (2 marks)
3. mention the cranial nerve carrying parasympathetic supply to the gland and the gannglion of relay (2 marks) (Sept. 2012)

44. **(Case):**
A patient presented with a red, swollen and painful right eye. The movements of the right eye were painful and the pupil of that eye was fixed and dilated. CT scan showed thrombosis of the cavernous sinus.
1-Define the venous sinus & its functions? (2marks)
2-Describe the site and contents of the cavernous sinus. (4marks)
3-Define the dangerous area of the face. Explain why this area is dangerous? (2marks)
4-Name the veins terminate in the cavernous sinus. (3marks) (June 2013)

45. **(Case):**
A young inexperienced doctor opened a parotid abscess by making a vertical incision, the patient became unable to raise the eyebrow on the operated side.
(a) Which nerve was injured? Specifically, mention the branch that was cut. (2 mark)
(b) What could the doctor do to avoid the lesion? 

(c) What are the structures present within the substance of the parotid gland? 
Mention how they enter and leave the gland.  
(d) Mention the surface anatomy of the parotid duct.  

Neck

1. Give an account on The investing layer of deep facial of the neck.  

2. Give an account on posterior triangle.  

3. Give an account on Thyroid gland.  

4. Give an account on contents &boundaries of posterior triangle of neck.  

5. Extracranial course of hypoglossal nerve & its distribution  

6. Describe the distribution of accessory nerve. How can you test for its injury.  

7. Give an account on The course, relations and distribution of the right phrenic nerve  

8. Enumerate branches of subclavian artery and the beginning , the end of its first part.  

9. Give an account on Carotid sheath. 

10. Thyrocervical trunk.  

11. Give an account on internal jugular vein.  

12. List the jugular veins. Give their beginning, termination and tributaries of each. Add note on their clinical significance.  

13. Give an account on lymphatic drainage of the tongue.  

14. Give an account on:  
   a) Infrahoid muscle.  
   b) Posterior belly of digastric muscle.  
   c) Sternoceleidomastoid muscle.  
   d) Genioglossus muscle.  
   e) Stylopharyngeus muscle.  
   f) Geniohyoid muscle.  
   g) Cricothyroid muscle.  
   h) Hyoglossus muscle.  
   i) Sternohyoid.  

15. Give an account on the nerve supply, mucous membrane and muscles of 
   a) tongue  
   b) larynx  

16. Motor nerve supply of tensor palati & thyrohyoid muscles.  

17. Give an account on nerve supply of pharynx & larynx.  

18. Give an account on Sensory innervations of external nose.  

19. Describe Lateral wall of nose.
20. Mention boundaries and floor of carotid triangle of the neck. (4marks) (June 2013)

21. **Cases:**

1) A 30 year-old woman complained of a swelling in the anterior part of her neck, nervousness and loss of weight. The doctor examined her and found an enlarged thyroid gland which moved up and down with swallowing. He suggested that a subtotal thyroidectomy (partial removal of thyroid gland) had to be performed.
   a) Why do swellings of thyroid gland move up and down with swallowing? (1 M)
   b) What important structures could be injured in operations of thyroid gland? (2 M)
   c) Enumerate the main vessels supplying the thyroid gland. (2 M)
   d) Give the course and distribution of the glossopharyngeal nerve. (10 M)
   e) Describe action & nerve supply of the following muscles: hyoglossus, sternohyoid, lateral pterygoid, inferior oblique of eyeball, and sternocleidomastoid. (10 M)

2) A 2 years old boy was brought to the hospital, his mother noticed abnormal position of his neck. The doctor noted that the neck was bent to the left side while the face looked to the right.
   1 - Name this clinical condition. (1 mark)
   2 - Which muscle is involved? Indicate the side affected? (2 marks)
   3 - What is the nerve supply of this muscle? (1 mark)
   4 - Name another muscle supplied by the same nerve. (1 mark)

3) A 65 year old man fell & lost his consciousness at the gate of a hospital. The doctor rushed & felt for pulse in front of sternomastoid muscle.
   1. Which artery's pulse did he feel? (1 mark)
   2. From which aortic arch did this artery develop? (1 mark)
   3. At which level in the neck does it divide into its terminal branches? (1 mark)
   4. What is the relation of the vein to the artery in the neck? (1 mark)
   5. Name one structure present at the bifurcation (termination) of the artery & mention its significance. (1 mark)

4) A 42 year old woman came to the hospital with a swelling in the front of the neck. The swelling extended till the thyroid cartilage. It moved up and down with swallowing. This case was diagnosed as a thyroid swelling. Thyroidectomy was performed and two months later the patient returned to her doctor complaining of changes of her voice and frequently occurring cramps.
   1. Why does the swelling move up and down with swallowing? (1 mark)
   2. Explain why a thyroid swelling can not extend up beyond oblique line of thyroid cartilage? (1 mark)
   3. Explain the changes in voice and the muscle cramps that this patient had following thyroidectomy? (1 mark)
   4. List two anomalies related to the development of the thyroid gland (2011)
The answer:

1) The thyroid swelling moves up and down with swallowing because it is invested by pretracheal layer of the deep cervical fascia. (1 mark)

2) The thyroid swelling cannot extend up beyond the oblique line of the thyroid cartilage due to attachment of infrahyoid (sternothyroid) muscles. (1 mark)

3) Changes of voice occur due to injury of external laryngeal nerve (supplies cricothyroid muscle) during ligation of superior thyroid artery. Injury of recurrent laryngeal nerve which supplies other laryngeal muscles occurs during ligation of inferior thyroid artery. Muscle cramps occur due to removal of the parathyroid glands during thyroidectomy. (3 marks)

4) Two congenital anomalies of thyroid gland: any two (2 marks)
   a. Agenesis of the gland.
   b. Incomplete descent; the gland may be found at any point between the base of the tongue and the trachea (e.g. lingual thyroid).
   c. Thyroglossal cyst.

5) An athlete used to lift heavy weights, suddenly developed weakness and coldness of his right upper limb. The condition diagnosed as hypertrophy of scalenemuscles causing compression of an artery passing between these muscles. (3 Marks)
   1. Name the artery involved in that case. (1 Mark)
   2. Mention structures passing between scalene muscles. (June 2012)

6) An athlete that used to lift heavy weights, suddenly developed severe pain in his neck and turn of his face to the right side. (3 marks)
   1- Name the affected muscles. (1 mark)
   2- Mention the nerve supply. (1 mark)
   3- Name the fascia enclosing this muscles? (1 mark) (Sept 2012)

7) A female developed benign swelling of lower pole of left thyroid lobe. The doctor decided to excise the swelling surgically. (5 Marks)
   1. Name the artery that should be ligated during surgery. (1 Mark)
   2. What is the nerve that accompanying the above artery? (1 Mark)
   3. What is supplied by the above nerve. (2 Marks)
   4. If the nerve is cut, what will happen? (1 Mark) (2012)

8) During surgical removal of the thyroid gland, a ligature slipped from the superior thyroid artery. To stop the bleeding, the surgeon blindly compressed the artery with a forceps. Later, the patient spoke with husky voice.
   a. From your anatomical knowledge, explain the reason to the husky voice. (June 2014)
   b. Enumerate the veins draining the thyroid gland & their termination.

9) A 30 years old lady visited her doctor complaining of headache and unilateral nasal discharge especially during the night. The doctor noticed tenderness over the maxilla & after doing an X-ray to the head and neck, he told her she had sinusitis.
a) Which Para nasal air sinus is affected?  (1 Mark)
b) Why is it the most commonly infected Para nasal sinus?  (2 Marks)
c) Why is the discharge more at night?  (1 Mark)
d) What is the nerve supply of the sinus?  (1 Mark)(May 2008)

10) A patient when asked to protrude his tongue outside the mouth cavity the doctor observed that the tip of tongue is directed to the left side the facial muscles as well as the rest of body muscles where normal.  (5 marks)
1-what is the diagnosis?  (1 mark)
2-Name the muscles responsible for protrusion of the tongue  (1 mark)
3-Mention the lymphatic drainage of the tongue ?  (3 marks)(sept 2012)

11) A 54 years old man presented with a tumor in the posterior cranial fossa. The neurologist wanted to check the integrity of the 9th, 10th and 11th cranial nerves.
1-How can you test for integrity of vagus nerve?  (1 mark)
2-Enumerate sensory branches of glossopharyngeal nerve.  (2 marks)
3-Name the muscle(s) supplied by the accessory nerve.  (3 marks)(June 2013)

12) A 50-year-old male started to complain from difficulty in swallowing few weeks ago. He had a computerized tomography scan (CT scan) on the neck done, it revealed the presence of a swelling (most likely cancer) near the jugular foramen.
(a) In this patient, which nerves could be involved and led to dysphagia?  (3 marks)
(b) Which venous sinuses are endangered by the cancer?  (1 mark)
(c) Describe the sensory and motor supply of the pharynx.  (3 marks)(Sept 2013)

**NeuroAnatomy**

- **Spinal cord & Tracts**:
  1) Give an account on levels of termination of dura matter of the spinal cord.
  2) Give an account on fourth ventricle (roof & floor & boundaries & foramina).  (May 2004)
  3) Give an account on pathway of pain & temperature.  (Sep 2004)
  4) Give an account on pathway of pain from the face and body.  (Sep 2007-May 2009)
  5) Give an account on pathway of proprioception of lower limb.  (Sep 2005)
  6) Give an account on pyramidal tracts.  (1988)
  7) Give an account on pathway of deep sensation.  (1991)
  8) Give an account on tracts of deep sensation of right big toe in the spinal cord.  (1989)
  9) Give an account on post. column of spinal cord.
  10) Give an account on differences between upper & lower motor neuron lesions.
  11) Give an account on two main tracts affected by hemisection of spinal cord.  (1989)
12) Give an account on blood supply (cervical part) of the spinal cord.  

13) Give an account on lesions of spinal cord.  
   (May 1998)

**Brain Stem:**

1. Give an account on facial nerve nuclei.  
   (May 1999)

2. Give an account on vagal nerve nuclei & its distribution.  
   (May 2001, May 2005)

3. Give an account on trigeminal nerve nuclei.  
   (May 2002)

4. Give an account on glossopharyngeal nerve nuclei.  
   (May 2007)

5. Give an account on hypoglossal nerve nucleus (intracranial & extracranial & distribution).  
   (May 2009)

6. Give an account on nucleus solitarius.  
   (1990)

7. Give an account on different lemnisci (beginning & termination & function).  
   (May 2004)

8. Give an account on blood supply of medulla oblongata & its applied anatomy.  
   (May 2002 - Sep 2008)

9. Describe the arterial supply of medulla oblongata. Give a brief note on medial medullary syndrome.

10. Name the tract(s) carrying touch sensations of the face.  
    (3 marks)  
    (June 2013)

11. List the structures seen in the floor of the 4th ventricle.  
    (June 2014)

**Cerebral Hemispheres:**

1. Give an account on cranial subarachnoid space.  
   (Sep 1998)

2. Give an account on sulci & gyri & functional areas & blood supply of temporal lobe.  
   (May 2000)

3. Give an account on site & effects of lesions of speech areas.  
   (Sep 2006 - May 2010)

4. Give an account on somatomotor areas.  
   (May 1998)

5. Give an account on functional areas of superolateral surface of frontal lobe & its blood supply.  
   (May 2007)

6. Give an account on site & blood supply & effects of lesion of cortical areas: auditory & visual & ant. part of paracentral lobule.  
   (May 2008)

7. Give an account on features of lateral ventricle.  
   (May 2008)

8. Give an account on association fibers.  
   (Sep 2008)

9. Give an account on internal capsule & its blood supply.  
   (Sep 1999 - May 2003)
**Diencephalon:**
1. Give an account on third ventricle. (Sep 2000 - Sep 2001 - May 2005)
2. Give an account on corpus callosum. (1997)
   Describe the association fibers of the cerebral hemispheres. (10 M)

**Blood Supply of the brain:**
1. Give an account on vertebro-basilar blood supply. (May 2010)

**Special Sense Pathways:**
Give an account of visual pathway & effects of its lesion at different levels. (Sep 2001-1989)

**Cases:**
1. A teenager girl discovered loss of sensation of her right hand and on examination the doctor discovered loss of pain and temperature of distal part of the upper limb. Also, there was diminished pain and temperature on left hand. The condition was diagnosed as cavitations of the spinal cord. (4 Marks)
   a) What is your diagnosis? (1 Mark)
   b) Why the pain and temperature fibers are only involved in this case? (1 Mark)
   c) Where is the most common site for such condition? (2 Marks) (2012)

2. A lady 55 years old, developed right sided hemiplegia mainly in the upper limb due to cerebrovascular accident as proved by MRI. The lesion affects the frontal and parietal lobes. (5 Marks)
   1- Which vessel was affected in this case? (1 Mark)
   2-list the name and location of the functional areas of the parietal lobe
   3-if the patient is right handed, do you expect the affection of speech? State why? (June 2012)

3. An old man starts to develop headache and by MRI proved to have tumors of the medial geniculate body. (2 Marks)
   a) Where is the medial geniculate body is located? (1 Mark)
   b) Where do its efferent fibers project to? (1 Mark) (2012)

4. A mother brought her two month old baby to the doctor complaining that he has a large head. MRI confirmed hydrocephalus with enlarged lateral ventricles.
   a) Where do you expect the obstruction to the flow of CSF exists? (2011)
   b) Describe the formation and flow of cerebro-spinal fluid (CSF)
   c) Describe the flow of blood from the superior sagittal sinus to the outside of the skull.

**The answer:**
1. The obstruction to the flow of CSF is at interventricular foramen of Monro. (1 mark)
2. The formation of CSF (5 marks)
   a. Choroid plexuses of the ventricles
   b. Little from ependyma lining the ventricles
   
   The flow of CSF:
   Lateral ventricle…..interventricular foramen of Monro…..3rd ventricle…..aqueduct of Sylvius…4th ventricle….foramen of Magendi and foramina of Luscka….subarachnoid space around brain or around spinal cord
   c. The flow of blood from superior sagittal sinus…..confluence of sinuses…right transverse sinus….right sigmoid sinus….right internal jugular vein.

5. A 60 year old female complained of a sudden disturbance in gait , intension tremors , ptosis of right eyelid , decreased sweating on right side of face, decreased pain sensation on right side of face, a difficulty in swallowing. Pain sensation was decreased on the left side of the body. A diagnosis of lateral medullary syndrome was made.

1. What causes this syndrome? (2011)

The answer:
1. Damage to the lateral part of the medulla due to occlusion of the posterior inferior cerebellar artery. (1 mark)
2. Sudden disturbance in gait and intention tremors due to affection of spinocerebellar tract and inferior cerebellar peduncle
   Ptosis of the right eyelid due to affection of the descending sympathetic fibres (ipsilateral horner’s syndrome)
   Decreased sweating on the right side (ipsilateral horner’s syndrome i.e anhydrosis)
   Decreased pain sensation on the right side of the face due to affection of spinal nucleus and tract of trigeminal
   Difficulty in swallowing due to affection of the nucleus ambiguus ( ipsilateral paralysis of muscles of palate and pharynx)
   Decreased pain sensation on the left side of the body due to affection of spinal lemniscus or lat. Spinothalamic tract (loss of pain from opposite half of the body)

6. A teenager girl fell from a height . on examination the doctor discovered loss of sensation of the whole lower limbs and up to level of umbilicus . also there was paralysis of both lower limbs (4 marks)

1 - what is your diagnosis (1 mark)
2 - mention the level of spinal cord segment affected (1 mark)
3 - enumerate the arterial supply of the spinal cord (2 marks) (sept 2012)

7. A lady 55 years old developed right sided hemiplegia together with affection of lower 7&12 cranial nerves due to cerebrovascular accident (5 marks)

1 - where is the site of lesion (1 mark)
2 - which vessel is most likely affected (1.5 mark)
3 - enumerate the different parts of the affected area (2.5 marks) (sept 2012)

8. An old man starts to develop headache and by MRI proved to have tumour at the cerebellopontine angle (2 marks) (sept 2012)
   1. What is the 1st cranial nerve to be effected by that tumor? (1 mark)
   2. Enumerate the symptoms resulting from compression of that nerve? (1 mark)

9. An old man had right side hemiplegia sparing the distal part of lower limb following a stroke. Neurological examination & investigation diagnosed intracerebral hemorrhage that interrupted the blood supply to the frontal and parietal lobes.
   1-List the functional areas of the parietal lobe. (4 marks)
   2-Which cerebral artery was involved? (1 mark) (June 2013)

10. A 70-year-old man suddenly developed right sided hemiplegia with aphasia, he could move his foot weakly but was unable to close his fist at all on the affected side. Magnetic resonance imaging (MRI) proved the occurrence of cerebral embolism.
   (a) Which cerebral artery is likely occluded? Explain (3 marks)
   (b) Locate the speech areas that you know. Mention their functions (3 marks) (sept 2013)

11. A 25-year-old patient had an operation under spinal anesthesia. During recovery, he could not feel the back of his lower limb with difficulty in climbing the stairs by the right foot.
   (a) If the site of lumbar puncture was correct and the spinal cord was not injured, what else could have been injured? (1 mark)
   (b) Where is the correct site for doing a lumbar puncture? (1 mark)
   (c) Where does the spinal cord normally end in such a patient? (1 mark)
   (d) What is the level of termination of the spinal meninges? (2 marks) (sept 2013)

12. A 50-year-old hypertensive woman suddenly developed loss of sensation and weakness in her right hand.
   a. Occlusion of which cerebral artery can cause this? Explain.
   b. Where does this artery arise from?
   c. What are the deep structures supplied by its central branches? (June 2014)

**Abdomen**

2. Give an account on The superior Mesenteric artery. (1996)

5. Give the relations, peritoneal covering and blood supply of the stomach. 

6. Describe the peritoneal covering, relations and arterial supply of the first part of duodenum. (May 2008) (relations: June 2013-4marks)
   - Compare between the jejunum and the ileum. (June 2014)


12. **Case** (2008):
   A surgeon performing an appendicectomy (removal of the appendix) found many adhesions as he opened the patient's abdomen. He tried to find the base of the appendix but it was difficult.
   a) With your anatomical knowledge, can you recommend a way to find the base of the appendix?
   b) What is the most common position for the appendix?
   c) Describe the surface anatomy of the vermiform appendix
   d) While operating, the surgeon cut through muscle fibers directed downward, forwards and medially. Name this muscle.
   e) Why is appendicular pain felt first around the umbilicus then shifts to the right iliac fossa

13. **Case** (2008):
   In an operation for treatment of chronic gastric ulcer, it was found that the posterior wall of the patient's stomach was stuck to his posterior abdominal wall.
   a) Which structures lie behind the stomach and can be involved in the disease?
   b) Name a large artery that runs behind the stomach and maybe eroded by the chronic ulcer?
   c) Enumerate the arteries which supply the stomach?

14. **Case** (2012)
   A young man during a quarrel got a transverse cut wound of the anterior abdominal wall just above the umbilicus and to the left. He put his hand on the wound and found port of his intestine coming out of the wound. (6 Marks)
   1- Which parts of the intestine can protrude through this wound (based on the site of the wound)
   2- What other structures (other than intestine) may protrude through this wound?
   3- How can the doctor identify the part of the intestine coming out of the wound. (3 Marks)
15. **Case** (2012)
   An abscess of anterior abdominal wall just below the umbilicus was discovered in a diabetes patient, causing pain and lymph node enlargement.
   1- Which spinal cord segment receives pain from that area? (1 Mark)
   2- Which group of lymph node is enlarged in that case? (1 Mark)

16. **Case** (2011)
   A 75 year old man with chronic cough noticed that a bulge was developing in his left groin. On examination, an elongated swelling was seen above the medial end of the left inguinal ligament. When the patient coughed, the swelling enlarged but did not descend into the scrotum.
   1. What is the possible diagnosis of this swelling
   2. Give reasons for your diagnosis
   3. Mention the borders of the inguinal triangle
   4. Mention structures forming posterior wall of the inguinal canal

**Answer:**
1. The diagnosis is left direct inguinal hernia. (1 mark)
2. Old age and chronic cough. (1 mark)
3. The borders of inguinal triangle are:
   a. Medially: lateral border of the rectus abdominis
   b. Laterally: inferior epigastric artery
   c. Inferiorly: inguinal ligament
4. Structures forming posterior wall of the inguinal canal: (1.5 marks)
   1. Fascia transversalis: along its whole length
   2. Conjoint tendon: in its medial half
   3. Reflected part of the inguinal ligament

17. **Case** (2011)
   A 32 year old woman presented to the physician with increasing loss of weight & vomiting. The physician noted that she was jaundiced and on examination a mass was palpable below the edge in the right upper quadrant. The diagnosis of cancer head of pancreas was made.
   1. what is the reason for jaundice?
   2. enumerate anterior and posterior relations of neck of pancreas.

**Answer:**
1. The reason of jaundice is obstruction of the common bile duct. (1 mark)
2. The anterior and posterior relations of neck of pancreas: (2 marks)
   Anteriorly: pylorus of the stomach. The gastroduodenal artery descends in front of the junction between the head and neck
   Posteriorly: Termination of superior mesenteric vein and splenic vein and the beginning of the portal vein

18. **Case** (sept 2012):
   A young man developed severe abdominal colic especially around the umbilicus that gradually shifts to the right iliac fossa. also there was fever and vomiting. (6 marks)
1. What is your diagnosis?  
2. Describe the surface anatomy of the affected structure?  
3. Mention four different sites of the different structure?  
4. What is the source of its blood supply?

19. Case (Sept 2012)  
A male farmer patient 35 years old, presented severe bloody vomiting. 
1. What is the possible reason of such case?  
2. Mention the anatomical base of this condition?

20. Case (June 2013)  
A 27 years old man was admitted to the surgical ward with hematemesis (vomiting blood). After resuscitation, clinical investigations had diagnosed portal hypertension.  
1- Explain the cause of hematemesis in this case.  
2- List other site(s) could be involved in such case.  
3- Describe formation, course & termination of the portal vein.

21. Case (Sept 2013)  
A 40-year old lady developed pain in the right shoulder. Her doctor noticed that she feels pain when he touches a certain point in the upper right part of her abdomen. She had ultrasonography that showed the presence of multiple small gall bladder stones. After few months she developed obstructive jaundice.  
(a) Explain the pain in the right shoulder.  
(b) Locate the point of maximum pain in the abdomen in this patient.  
(c) What is the length of the common bile duct?  
(d) Describe the course and termination of the common bile duct.

22. Case (June 2014)  
A 40-year-old man discovered a swelling in his right groin that bulges out on coughing. His doctor noticed that the swelling did not reach the scrotum. He also noticed an old appendicectomy scar. He told the patient that a fault in the appendicectomy might have caused his groin swelling.  
a. From your anatomical knowledge, which type of inguinal hernia the patient is having? Explain the reason for your diagnosis.  
b. What had probably been injured during the appendicectomy? How could it lead to this hernia?

Pelvis

1. Describe the reflection of peritoneum in the male & female pelvis.  
2. Give the peritoneal covering of the following organs: urinary bladder, rectum and duodenum.  
3. Enumerate branches of internal iliac artery.
4. Give an account on the anatomy of the rectum with its blood supply and lymphatic drainage (1996) / Describe the anatomy of the anal sphincters. (June 2014)

5. Give the relations of base of urinary bladder (May 2010) & in male (Sept 2007)


8. Prostate (position, relations, lobes, blood supply and development) (2002)

9. Give the position, relations, ligaments, blood supply and lymphatic drainage of ovary (May 2004)

10. Give an account the anatomy (parts, dimensions and arterial supply) of the uterine tube. (2000) (Sept 2008)


12. Give the parts and content of broad ligament of uterus (May 2002-2006)


15. Describe the blood supply of urinary bladder. (4 marks) (June 2013)

**Cases:**

1. A 55 years old male presented with severe pain at anal orifice with mild bleeding during defecation. The condition was diagnosed as anal fissure and piles. (5 marks)
   a) Name the nerve that carries the pain sensation from the anal canal. (2 Marks)
   b) Which vessels are bleeding. (2 Marks) (2012)
   c) Describe the beginning, direction and length of anal canal. (2 Marks)

2. A 16 year old boy was riding his bicycle when his foot slipped off the pedal and his perineum hit the bar of the bicycle an hour later, he was admitted to the hospital unable to micturate. On examination, he had extensive swelling of his penis and scrotum. A diagnosis of ruptured urethra was made.
   a) Which part of the urethra is more liable to injury? (1 mark)
   b) Name the striated muscle surrounding the membranous urethra (2011)
   c) Describe the features of the mucosa of posterior wall of the prostatic urethra (2011)
   d) Mention the lymph nodes that drain the different parts of the male urethra (2011)

**Answer:**

1) The penile part at its junction with the membranous part of the urethra is more liable to injury. (1 mark)
2) The sphincter urethrae muscle surrounds the membranous part of urethra. (1 mark)

3) Features of the mucosa of posterior wall of the prostatic urethra. (2 marks)
   a. Midline longitudinal ridge (urethral crest)
   b. Shallow depression on either side of the crest (prostatic sinus)
   c. Orifices of prostatic ducts
   d. Colliculus seminalis in the middle of the urethral crest
   e. Openings of the ejaculatory ducts

4) Lymph nodes that drain the different parts of the male urethra:
   a. Prostatic and membranous urethra …..internal iliac lymph nodes (1 mark)
   b. Spongy urethra……deep inguinal lymph nodes and few pass to superficialinguinal lymph nodes & some to external iliac lymph nodes. (any LN=1 mark)

3. A 55 years old male presented with severe abdominal pain and absolute constipation. On examination there was a tumour at lower part of rectum
   1. What is the length of the rectum ? (5 marks) (1 mark)
   2. Describe different curves of the rectum ? (2 marks)
   3. Explain the venous drainage of rectum ? (2 marks) (sept 2012)

4. A 60-year-old man observed fresh blood on passing stools. On rectal examination, the doctor discovered cancer rectum. (Sept 2013)
   (a) If the cancer spreads anteriorly , which structures may be invaded? (2 marks)
   (b) Which artery causes bleeding of the cancer is limited to the mucosa? (1 mark)
   (c) If the cancer spreads along lymphatics , which groups may be involved? (2 marks)

5. While riding a bicycle, a 24-year-old man fell and his perineum hit the bar of the bicycle strongly. Later, he did not pass urine, few drops of blood passed out from his external urethral meatus and painful swelling of his lower part of the anterior bdominal wall that did not extend into the thighs was noticed. A diagnosis of ruptured urethra was made.
   a. Which part of the urethra is likely injured? (June 2014)
   b. What prevents extension of the swelling down the thighs?
   c. Name three other sites where the swelling would extend to.

**Embryology**

- **Development of H & N :**
  1) Give an account on derivatives of the brachial arches. (94, Sep 2002)
  3) Derivatives of the second pharyngeal arch. (Sep 2003, 2006, 2007)
  4) Give an account on the derivatives of pharyngeal pouches. (May 2008)
  5) Give the fate of pharyngeal clefts. (90, 91, 98, 2000, 2007)
  6) Give an account on development of pituitary gland. (May 99)
8) Development of the tongue. (Sep 2003, 2006)
9) Describe development of the upper lip and its anomalies. (May 2012)
10) Development of the thyroid gland. (Sept 2006)
11) Enumerate the derivatives of the pharyngeal arch supplied by the facial nerve. (4 marks) (Sept 2013)

**Development of CNS:** Development of the spinal cord. (Sept 1999)

**Development of Skeletal System:** Development of the vertebra. (Sept 2005)

**Development of GIT:**
2. Give comment on the development of the Liver. (May 2008)
3. Enumerate derivatives of cloaca. (5 M)
4. List the derivatives of the dorsal and ventral mesogastria. (4 marks) (Sept 2013)

**Development of Urogenital System:**
1. Describe descent of testis and ovaries. Enumerate anomalies of this descent. (May 2005)
2. Enumerate the derivatives of mesonephric duct. (4 marks) (June 2013) Discuss the fate of the mesonephros in the male. (June 2014)
3. Give the developmental origin of the urinary bladder & List anomalies of the uterus (2011)

**Answer:**
The mucosa of the urinary bladder (except the trigone) is developed from the endoderm of the vesicle part of the primitive urogenital sinus. 
The trigone is developed from the absorbed lower ends of the mesonephric ducts.

**List anomalies of the uterus. (any 6 = 3 marks)**
1. Double uterus (uterus didelphys)
2. Uterus arcuatus (indent fundus)
3. Uterus septatus (septate uterus)
4. Uterus bicornis (has 2 horns)
5. Uterus bicornis unicollis with one rudimentary horn (atresia of one paramesonephric duct)
6. Uterus unicornis (aplasia of one paramesonephric duct)
7. Infantile uterus (hypoplastic uterus), normal ratio of body to cervix is 2:1; hypoplastic uterus the ratio is 1:2

**Cases:**
1. A mother of a 3-year-old female child, discovered that her umbilicus is wet with urineiferous fluid. (4 Marks)
   1. What is your diagnosis? (1 Mark)
   2. Describe in short the embryological sources of urinary bladder. (2 Marks)
   3. From where the female urethra develops? (1 Mark) (2012)
2. A 22-year-old female consulted a plastic surgeon about the presence of multiple holes along anterior border of sternocleidomastoid muscle. (4 Marks)
   a) Name this congenital anomaly? (1 Mark)
b) From where the external auditory meatus develops? (1 Mark)
c) From where the thymus gland develops? (2 Marks) (2012)

3. Define rachischisis. Give 3 anomalies arises through development of the spinal cord (2011)

**Answer:**
Rachischisis is failure of the neural tube to close. (1/2 mark)
Anomalies arising during development of the spinal cord: (1.5 marks)

a) Spina bifida occulta
b) Meningocele
c) Meningomyelocele
d) Rachischisis (myelocele)

A mother of a 3-year-old female child discovers that her umbilicus is wet with faecal fluid. (4 mark) (sept 2012)
a) Describe in short this congenital anatomy (mention its embryological development)
b) Mention the dates of occurrence and reduction of physiological umbilical hernia.

4. A 22-year-old female developed cystic swelling under cover of the anterior border of sternocleidomastoid muscle. (4 marks)
1. Name this congenital anatomy. (1 mark)
2. Describe how it develops? (2 mark)
3. From where the superior parathyroid gland develops? (1 mark) (sept 2012)

5. A married couple brought their one-year-old child to the doctor complaining that his right scrotum was empty while the left side contained a testis. The doctor searched several superficial sites that could probably contain the missing testis.
a) If none of the examined sites contained the testis, what is the likely diagnosis? What would the diagnosis be if the testis was found in any of these sites (for example, in the root of the penis)?
b) What is the role of the gubernaculum in either case?
c) List two more sites that the doctor searched. (June 2014)

**MCQ 2011**
*Choose one best answer & mark it on the computer sheet using 2B pencil*

1. *The superior cervical sympathetic ganglion gives branches:*
   a) To Pharynx
   b) To all cranial nerves
   c) To join 5th & 6th cervical nerves
   d) That accompany vertebral artery
   e) That accompany inferior thyroid artery
2. A patient was diagnosed with a tumour pressing on the jugular foramen. He could present with:
   a) Loss of taste from anterior part of tongue
   b) Inability to whistle
   c) Dysphagia
   d) Impaired hearing
   e) Inability to clench teeth

3. Repeated middle ear infections in a child have destroyed the tympanic plexus in the middle ear cavity. This leads to affection of secretion of which gland?
   a) Lacrimal
   b) Nasal
   c) Palatine
   d) Parotid
   e) Submandibular

4. A 25 year old male was transferred to the hospital after a car accident. X-Ray & MRI showed a fractured pterion & extradural haemorrhage. The bleeding vessel is:
   A. Internal carotid artery
   B. Middle meningeal artery
   C. Middle cerebral artery
   D. Superficial middle cerebral vein
   E. Superior cerebral veins

5. Destruction of ciliary ganglion results in:
   A. Severe ptosis
   B. Paralysis of inferior oblique
   C. Loss of lacrimation
   D. Loss of pupillary light reflex
   E. Constriction of pupil (miosis)

6. A tumour bulging into the orbit from its floor would be arising from:
   A. Sphenoid sinus
   B. Maxillary sinus
   C. Nasal cavity
   D. Oral cavity
   E. Ethmoid sinus

7. A patient when asked to protrude his tongue, the tip deviated to the right and the right side of the tongue showed wasting and fasciculations. This could indicate a lesion in:
   A. Right glossopharyngeal nerve
   B. Left glossopharyngeal nerve
   C. Right hypoglossal nerve
   D. Left hypoglossal nerve
   E. Internal capsule.
Match nerves in right column with items in left column (use each item once only)

8. Greater petrosal .................. A. smiling
9. Ophthalmic ....................... B. mastication
10. Facial .............................. C. lacrimation
11. Infraorbital ....................... D. pain from maxillary sinusitis
12. Mandibular ....................... E. sensory to cornea

Match structure on the right with the appropriate group of draining lymph nodes on the left (each item may be used more than once or not at all)

13. Palatine tonsil A. deep parotid
14. Lower central incisors B. superficial cervical
15. Tip of tongue C. jugulo-digastric
     D. jugulo-omohyoid
     E. submental

16. A foreign body arrested at the pyriform fossa irritates which of the following nerves?
    A. superior laryngeal  B. glossoharyngeal  C. recurrent laryngeal
    D. internal laryngeal  E. external laryngeal

17. Wax in external auditory meatus can irritate which nerve causing vomiting?
    A. facial      B. auriculotemporal  C. great auricular  D. vagus  E. lesser occipital

18. Scalenus anterior muscle lies anterior to all the following EXCEPT:
    A. Suprapleural membrane  B. Subclavian artery  C. Subclavian vein
    D. Lower trunk of brachial plexus  E. Scalenus medius

19. Spasmodic torticollis was diagnosed in an infant whose head was tilted to the right with the chin turned to the left. Which of the following nerves could be involved?
    A. right cranial accessory  B. left cranial accessory  C. right spinal accessory
    D. left spinal accessory  E. greater occipital

20. The maxillary nerve supplies:
    A. upper eyelid   B. skin of forehead  C. lower lip
    D. upper jaw teeth   E. mucosa lining buccinators

21. Submandibular duct opens into:
    A. vestibule of mouth opposite 2nd molar  B. vestibule of mouth opposite 3rd molar
    C. top of sublingual fold  D. top of sublingual papilla  E. oropharynx

22. Median atlanto-axial joint is of which type?
    A. fibrous  B. 2ry cartilaginous  C. synovial plane
    D. synovial hinge  E. synovial pivot

23. The Eustachian tube gives attachment to which of these muscles?
    A. levator palati  B. stylopharyngeus  C. palatopharyngeus
    D. stylohyoid  E. stapedius
24. The facial colliculus is formed by:
A. Facial nerve  B. Abducent nucleus
C. Facial motor nucleus  D. Abducent nucleus & facial nerve fibers
E. Facial motor nucleus & abducent nerve fibers

25. The fornix connects:
A. Thalamus & hypothalamus  B. Hypothalamus & hippocampus
C. Hippocampus & substantia nigra  D. Septal areas to habenular nuclei
E. Amygdaloid nuclei to septal areas

26. The frontal lobe of the non-dominant hemisphere is concerned with which of the following functions:
A. Production of speech  B. Understanding of speech
C. Reflex conjugate eye movement  D. Receiving auditory stimuli
E. Control of behavior

27. Arterial supply of Wernicke’s area is via:
A. anterior cerebral  B. middle cerebral  C. posterior cerebral
D. anterior & middle cerebral  E. anterior & posterior cerebral

28. A 47-year old man complains of right arm weakness and difficulty speaking (expressive aphasia). Which of the following arteries is most likely affected?
A. central branches of anterior cerebral  B. cortical branches of anterior cerebral
C. central branches of middle cerebral  D. cortical branches of middle cerebral
E. cortical branches of posterior cerebral

29. Which of the following surfaces (aspects) of thalamus is related to posterior limb of internal capsule?
A. superior  B. inferior  C. medial  D. lateral  E. posterior

30. The right trochlear nucleus:
A. lies at level of superior colliculus  B. receives contralateral cortico-nuclear fibers only
C. lies in the special visceral efferent column of nuclei  D. supplies the left superior oblique muscle
E. its lesion causes left lateral squint

31. The cuneate tract carries which of the following sensations?
A. Crude touch from upper limb  B. Fine touch from upper limb
C. Crude touch from upper & lower limbs  D. Fine touch from upper & lower limbs
E. Unconscious proprioception from upper & lower limbs
32. Which of the following belongs to the limbic system:
A. Hippocampus  B. Cuneus  C. Paracentral lobule  
D. Lentiform nucleus  E. Ventral posterior nucleus of thalamus

33. Which of the following is considered association fibers of cerebral hemispheres?
A. Cingulum  B. Forceps major  C. Internal capsule  
D. Fornix  E. Corona radiate

34. Which of the following is part of the auditory pathway?
A. Medial lemniscus  B. Lateral lemniscus  C. Lateral geniculate body  
D. Inferior temporal gyrus  E. Superior colliculus

35. Hemisection of the spinal cord would result in the following on the opposite side below the level of lesion:
A. Loss of pain & temperature  B. Motor paralysis  
C. Loss of joint sense  D. Loss of muscle sense  E. Loss of vibration sense

36. Nucleus ambiguous supplies all the following muscles EXCEPT:
A. Pharyngeal constrictors  B. Stylopharyngeus  C. Tensor palate  
D. Levator palate  E. Cricothyroid

37. Internal arcuate fibers are axons of:
A. Inferior olivary nucleus  B. Accessory olivary nucleus  
C. Accessory cuneate nucleus  D. Gracile & cuneate nuclei  E. Arcuate nuclei

38. Syringomyelia affects selectively which segments of the spinal cord?
A. Cervical & upper thoracic  B. Thoracic  C. Lower thoracic & upper lumbar  
D. Lumbar & upper sacral  E. Sacral

39. The anterior spinal artery supplies:
A. Inferior olivary nucleus  B. Hypoglossal nucleus  
C. Dorsal white column of spinal cord  D. Dorsal vagal nucleus  E. Vestibular nuclei

40. Bitemporal hemianopia results from a lesion of:
A. Optic nerve  B. Optic chiasma  C. Optic tract  
D. Lateral geniculate body  E. Visual area

41. An aneurysm of the posterior cerebral artery can affect which of the following nerves?
A. Oculomotor  B. Trigeminal  C. Facial  D. Vagus  E. Hypoglossal
42. Which of the following nuclei receives pain & temperature from head area?
A. nucleus solitaries                  B. spinal nucleus of trigeminal
C. main sensory nucleus of trigeminal  D. nucleus ambiguous
E. dorsal vagal nucleus

43. The facial nerve has all these nuclei of origin EXCEPT:
A. motor                             B. inferior salivatory
C. spinal nucleus of trigeminal      D. salitaries
E. superior salivatory

44. The transpyloric plane cuts all the following structures EXCEPT:
A. Hilum of left kidney.               B. Stem of superior mesenteric artery.
C. Termination of the spinal cord.     D. Pylorus of stomach.
E. Body of gall bladder.

45. The superficial inguinal lymph nodes drain the following areas EXCEPT:
A. Skin of scrotum.                    B. Infraumbilical part of anterior abdominal wall
C. Anal canal above the pectinate line D. Vaginal canal below the hymen.
E. Superolateral angles of the uterus.

46. In the female, the superficial inguinal ring gives passage to:
A. ovarian artery.                     B. iliohypogastric nerve.
C. ovarian gubernaculum.               D. femoral branch of genitofemoral nerve.
E. round ligament of the uterus.

47. Omental bursa (lesser sac) separates the back of the stomach from:
A. right crus of diaphragm.            B. left crus of diaphragm
C. gastroduodenal artery.             D. right kidney.
E. inferior vena cava.

48. The fundus of the stomach gets its main arterial supply via:
A. right gastric artery.               B. right gastro-epiploic artery.
C. short gastric arteries.             D. left gastric artery.
E. posterior gastric artery.

49. All the following are branches from the ileocolic artery EXCEPT:
A. anterior caecal.                    B. posterior caecal.
C. ileal.                             D. jejunal.
E. appendicular

50. The arterial supply of the left colic flexure is via:
A. superior mesenteric artery.        B. lower left colic artery.
C. marginal artery.                   D. middle colic artery.
E. inferior pancreaticoduodenal artery.

51. The common bile duct while passing behind the head of pancreas is related posteriorly to:
C. Inferior vena cava.                D. Aorta.
E. The main pancreatic duct.

52. The notched border of the spleen is related to which rib?
A. 7th                     B. 8th          C. 9th          D. 10th        E. 11th
53. Tributaries of the portal vein include:
A. gastric veins  B. renal veins  C. phrenic veins.
D. right suprarenal vein.  E. hepatic veins.

54. All the following represent bare areas of the liver EXCEPT:
A. Fissure for ligamentum venosum.  B. Fossa of gall bladder.  C. Caudate lobe
D. Fissure for ligamentum teres.  E. Porta hepatis.

55. Medial border of psoas major muscle is related to which nerve?
D. Femoral nerve.  E. Iliohypogastric.

56. To pass a needle into the cavity of the tunica vaginalis in the scrotum, the following structures have to be pierced EXCEPT:
A. Skin  B. Dartos muscle  C. Internal spermatic fascia
D. Cremasteric fascia  E. Tunica albuginea.

57. Pudendal canal contains:
A. Systemic venous drainage of anal canal.  B. Middle rectal artery.
C. Nerve supply to obturator internus muscle.  D. Terminal part of inferior hypogastric plexus.  E. Lymph nodes.

58. Posterior division of internal iliac artery gives:
A. Iliolumbar artery.  B. Obturator artery.  C. Internal pudendal artery.
D. Median sacral artery.  E. Inferior gluteal artery.

59. The apex of urinary bladder is connected to which ligament?
A. Pubovesical ligaments.  B. Median umbilical ligament.
C. Medial umbilical ligaments.  D. Lateral ligament of the bladder.
E. Lateral umbilical ligaments.

60. One of the following ligaments is not a true ligament of the uterus:
A. Round ligament of the uterus.  B. Broad ligament of uterus.
E. Pubocervical ligament.

61. All the following muscles are attached to the perineal body EXCEPT:
A. bulbospongiosus  B. ischiocavernosus  C. external anal sphincter
D. levator ani  E. superficial transverse perinea.

62. The anterior wall of the vagina is related to:
A. ureter  B. uterine artery  C. urethra  D. rectum  E. anal canal.

63. The medial wall of the ischiorectal fossa is formed partly by:
A. obturator internus  B. gluteus maximus  C. skin
D. levator ani  E. sacrotuberous ligament.

64. The left ovarian vein drains into:
A. inferior vena cava  B. left renal vein  C. left suprarenal vein
D. inferior mesenteric vein  E. left uterine vein.
65. A patient has an ulcer of the posterior wall of 1st part of duodenum. Which artery is liable to erosion?
A. hepatic  B. splenic  C. gastroduodenal  
D. celiac  E. superior mesenteric

66. A patient with portal hypertension shows caput medusae. Which veins (belonging to portal circulation) caused this appearance?
A. inferior rectal  B. middle rectal  C. esophageal  
D. superior rectal  E. paraumbilical

67. The anal sphincter that is formed by thickening of the rectal circular muscle layer is:
A. superficial  B. internal  C. deep  D. subcutaneous  E. external

68. The lesser wing of sphenoid bone is derived from:
A. ala temporalis  B. parachordal cartilage  C. ala orbitalis  
D. periotic capsule  E. trabeculae cranii

69. Each of the following cells is derived from neuroepithelial cells, Except:
A. Ependymal cells  B. Microglial cells  C. Astrocytes  
D. Motor neurons  E. Oligodendroglia

70. Which of the following bones of skull develop by cartilagenous ossification:
A. Squamous temporal  B. Maxilla  C. Frontal  D. Parietal  E. Sphenoid

71. When the palatal processes of maxilla fail to fuse with each other, the resulting anomaly is a cleft of:
A. Uvula  B. Primary palate  C. Secondary palate  
D. Primary and secondary palate  E. Intermaxillary segment

72. Regarding development of the tongue all the following are true Except:
A. The posterior third develops from hypobranchial eminence  
B. The anterior two-third develops from 3swellings  
C. All muscles of the tongue develop from mesoderm of pharyngeal arches  
D. Failure of fusion of lingual swellings results in bifid tip of tongue  
E. Valate papillae are supplied by glossopharyngeal nerve

73. A muscle that develops from 3rd pharyngeal arch:
A. Stapedius  B. Stylohyoid  C. Stylopharyngeus  
D. Sternothyroid  E. Sternomastoid

74. The structure arising from the 1st pharyngeal pouch is:
A. Eustachian tube  B. Inferior parathyroid gland  
C. Superior parathyroid gland  D. Palatine tonsil  E. Thymus gland

75. The third pharyngeal arch cartilage gives rise to which of the following structures:
A. Stylohoyid ligament  B. Thyroid cartilage  
C. Styloid process  D. Sphenomandibular ligament  E. Greater cornu of hyoid bone
76. Meckel's diverticulum:
A. Is a remnant of the urachus
B. Is found in 10% of the population
C. Is most commonly situated adjacent to the vermiform appendix
D. Can give symptoms similar to an inflamed appendix
E. Is usually 6 inches long

77. A 3-week-old infant has a history of vomiting. The vomitus did not contain bile. He did not gain any weight. Which of the following would best account for these symptoms?
A. Patent vitello-intestinal duct
B. Esophageal atresia
C. Hypertrophic pyloric stenosis
D. Tracheo-esophageal fistula
E. Double gall bladder

78. Each of the following statements about the developing duodenum is true EXCEPT:
A. Is a derivative of foregut and midgut
B. The vitello-intestinal duct is attached to the apex of the duodenal loop
C. Its dorsal mesentry is absorbed
D. It rotates with the stomach
E. Its lumen is temporarily obliterated by epithelial cells

79. Ectopia vesicae (Exstrophy of the urinary bladder) is often associated with:
A. Adrenal hyperplasia
B. Urachal fistula
C. Hypospadias
D. Epispadias
E. Chromosomal abnormalities

80. The paramesonephric ducts in female embryos give rise to:
A. Paroophoron
B. Uterine tubes
C. Inferior part of the vagina
D. Round ligaments of the uterus
E. Ovarian ligaments

MCO 2012 Anatomy Exam

1. Internal carotid blood is lost from a wound in the:
   A- Forehead  B-Temple  C-Auricle  D- Chin  E- occiput
2. Which of the following structures is first liable to be injured in case of incision of parotid abscess?
   A-External carotid artery  B-Facial nerve  C-Auriculotemporal nerve
   D-Retromandibular vein  E-Facial artery
3. The nerve that runs along the floor of the cavernous sinus is:
   A-The oculomotor nerve  B-The trochlear nerve  C-The ophthalmic nerve
   D-The maxillary nerve  E-The abducent nerve
4. Rupture of the middle meningeal artery causes what type of hemorrhage?
   A-extradural hemorrhage  B-Subdural hemorrhage
   C-Subarachnoid hemorrhage  D-cerebral hemorrhage
   E-ventricular hemorrhage
5. The muscle that makes the eye look downwards and medially is:
   A-The superior rectus   B-The inferior rectus   C-The inferior oblique
   D-The medial rectus   E-The superior oblique

6. Which of the following nerves appears above the upper border of lateral pterygoid?
   A-The buccal nerve   B-The masseteric nerve   C-The lingual nerve
   D-The inferior alveolar nerve   E-The auriculotemporal nerve

7. The structure attached to the lingula of the mandible is the:
   A-stylomandibular ligament   B-pterigntymandibular raphe
   C-Tempromandibular ligament   D-sphenomandibular ligament
   E-Mylohyoid muscle

8. The sympathetic root to the submandibular ganglion is derived from the plexus around the:
   A- lingual a   B- Occipital a   C- Facial a
   D- Maxillary a   E- Ascending pharyngeal a

9. Which of the following arteries is a content of the posterior triangle of the neck?
   A-1st part of subclavian artery   B- 2nd part of subclavian artery
   C-Ascending cervical artery   D-Deep cervical artery
   E-Transverse cervical artery

10. Related to the medial side of the thyroid lobe:
    A- Sternomastoid   B- Recurrent laryngeal n.   C- Carotid sheath
    D- Investing fascia   E- Sternohyoid

11. Pain from the middle ear is carried on the following cranial nerve:
     A-VII   B-VIII C-IX   D-X   E-XI

12. The nerve that runs directly anterior to the scalenus anterior muscle is the:
     A-Upper trunk of brachial plexus   B-Suprascapular nerve
     C-Great auricular nerve   D-Transverse cervical nerve
     E-Phrenic nerve

13. The artery that runs along the upper border of post, belly of digastric is the:
     A- Lingual a   B-Facial a
     C- Posterior auricular artery   D-Occipital a
     E-Ascending pharyngeal a

14. Which of the following is a branch of facial artery?
     A- Inf. thyroid a   B- Vertebral a
     C-Tonsillar a   D-Middle meningeal a
     E- suprahyoid a

15. The structure directly related to the back of the odontoid process of the atlas vertebra is the:
     A- Apical ligament   B- Alar ligament
     C- Horizontal band of cruciate ligament   D-Posterior atlantooccipital membrane
     E-Tectorial membrane

16. The sphenoidal air sinus opens into the:
     A- Superior nasal meatus   B- Middle nasal meatus
     C- Hiatus semilunaris   D- Sphenoethmoidal recess
     E- Bulla ethmoidalis

17. Cancer in the tip of the tongue spreads to the following lymph nodes:
     A- Submandibular   B- Submental   C- Parotid   D- Occipital
     E- Pretracheal
18. The mucosa of laryngopharynx is supplied mainly by the following nerve:
   A- Vagus (internal laryngeal branch)  B- Vagus (pharyngeal branch)
   C- Glossopharyngeal  D-Cranial part of accessory
   E- Trigeminal

19. The action of cricothyroid muscle is:
   A- Shortens vocal cords  B- Stretches vocal cords  C- Adducts vocal cords
   D- Abducts vocal cords  E- Opens laryngeal inlet

20. Lies in the medial wall of middle ear cavity:
   A- promontory  B- tegmen tympani  C- pyramid
   D- carotid canal  E- auditory tube

21. The branch of facial nerve that arises from the geniculate ganglion is the:
   A- greater petrosal  B- nerve to stapedius  C- chorda tympani
   D- posterior auricular  E- cervical

22. Lymph drainage from the lobule of the ear passes to which group of lymph nodes:
   A- jugulodigastric  B- mastoid  C- submental
   D- submandibular  E- superficial cervical

23. A patient developed painful spasm of the neck muscles. This is most likely due to
   irritation of:
   A- Spinal accessory n,  B- great auricular n.  C- lesser occipital n.
   D- supraclavicular n.  E- transverse cervical nerve

24. At birth, the conus medullaris ends at which vertebral level?
   A- 1st lumbar  B- 3rd lumbar  C- 1st sacral
   D- 3rd sacral  E- 1st coccygeal

25. The ability to recognize an unseen familiar object placed in the hand depends on
   integrity of which tract?
   A- Lateral spinothalamic  B- Ventral spinothalamic  C- Spinocerebellar
   D- cuneo-cerebellar  E- Cuneate

26. The first order neuron in the pathway of pain from the face is:
   A- dorsal root ganglion  B- geniculate ganglion  C- trigeminal ganglion
   D- spinal nucleus of V  E- substantia gelatinosa of Rolandi

27. The first order neuron in the pathway of taste sensation from the ant 2/3 of the
   tongue is:
   A- dorsal root ganglion  B- geniculate ganglion  C- trigeminal ganglion
   D- spinal nucleus of V  E- substantia gelatinosa of Rolandi

28. Which of the following nuclei represent the somatic efferent column?
   A- Abducent nucleus  B- Nucleus solitarius  C- Nucleus ambiguous
   D- Dorsal vagal nucleus  E- Motor nucleus of V

29. Nucleus in brain common to IX, X and XI cranial nerves:
   A- Nucleus solitarius  B- Nucleus Ambiguus  C- Spinal nucleus of V
   D- Salivatory nucleus  E- Dorsal vagal nucleus
30. Which of the following cranial nerve nuclei is not connected to the medial longitudinal bundle:
   A- Oculomotor        B- Trochlear        C-Abducent          D- Cochlear         E- Facial

31. The superior cerebellar peduncle contains:
   A- Vestibulo-cerebellar tract   B- Cuneo-cerebellar tract
   C- Anterior spinocerebellar tract D- Posterior spinocerebellar tract
   E- Cortico-ponto-cerebellar fibers

32. 32- Which of the following thalamic nuclei relays motor impulses?
   A- Anterior thalamic nuclei       B- Intralaminar nuclei    C- Dorsomedial nucleus
   D- Lateral posterior nucleus      E- Ventral anterior nucleus

33. A patient presents with inability to understand words and speaks non-understandable words. Lesion is most likely in Brodmann areas number:
   A- 1, 2, 3            B- 44, 45        C- 17, 18         D- 41, 42          E- 39, 40

34. Changes in personality and judgment occur in lesion of:
   A- Frontal lobe            B- Parietal lobe      C- Broca's area
   D- Wernicke's area         E- Temporal lobe

35. The fornix connects:
   A- Thalamus & hypothalamus   B- Hippocampus & hypothalamus
   C- Hippocampus & substantia nigra D- Septal areas & habenular nuclei
   E- Amygdaloid nuclei & septal areas

36. The caudate and lenticular nuclei form together what structure?
   A- Stratum            B- Pallidum         C- Paleostriatum
   D- Corpus striatum    E- Neostriatum

37. Which of the following is a recess of fourth ventricle?
   A- Optic recess         B- Infundibular recess C- Lateral recess
   D- Pineal recess        E- Supraspinal recess

38. Arterial supply of Wernicke’s area is via:
   A- Anterior cerebral a.   B- Middle cerebral a.    C- Posterior cerebral a

39. A lesion in the anterior cerebral artery would most likely result in an inability to:
   A- Smile            B- Clench the fist    C- Whistle
   D- Swallow food     E- Climb the stairs

40. A muscle derived from the second branchial arch?
   A- Stapedius          B- Masseter         C- Stylopharyngeus
   D- Cricothyroid      E- Tensor palate

41. Innervation of the mucosa of post. 1/3 of tongue by glossopharyngeal n. indicates its development from:
   A- 1st arch           B- 2nd arch           C- 3rd arch         D- 4th arch         E- 5th arch

42. The lateral part of the upper lip is derived from the:
   A- Maxillary prominence B- Medial nasal prominence
   C- Lateral nasal prominence D- Intermaxillary segment
   E- Frontal prominence
43. The posterior wall of Rathke's pouch gives the:
   A- Pars distalis      B- pars tuberalis      C- pituitary cleft
   D- pars intermedia   E- pars nervosa

44. Bulging of the spinal cord and meninges through a defect in the back of vertebral canal is called:
   A- Rachischisis      B- spina bifida occulta  C- meningocele
   D- meningomyelocele  E- Anencephaly

45. Spongioblasts of the neural crest give rise to:
   A- sensory ganglia    B- sympathetic ganglia  C- Schwann cells
   D- melanocytes       E- chromaffin cells

46. Which of the following is Not derived from the ventral mesogastrium?
   A- greater omentum   B- falciform lig.      C- coronary lig.
   D- right triangular lig.  E- left triangular lig

47. The stem of liver bud gives rise to the:
   A- Cords of hepatocytes  B- Common bile duct  C- Liver stroma
   D- Liver sinusoids      E- Gall bladder

48. During abdominal operation, the surgeon noticed that the transverse colon was passing behind the second part of duodenum. This congenital anomaly is due to:
   A- Persistence of vitellointestinal duct   B- reversed rotation of midgut
   C- failure of reduction of midgut        D- failure of canalization of midgut
   E- persistent mesentery of midgut

49. The first generation of division of the ureteric bud gives the:
   A- The major calyces     B- The collecting tubules  C- The minor calyces
   D- The loop of Henle    E- The papillary duct of Bellini

50. The interstitial cells of Leydig are derived from this component of the indifferent gonad:
   A- coelomic epithelium    B- sex cords     C- endodermal germ cells
   D- mesoderm between sex cords  E- gubernaculum

51. The lower art of prostatic urethra as derived from:
   A- absorbed mesonephric ducts  B- Vesical part of urogenital sinus
   C- pelvic part of urogenital sinus  D- phallic part of urogenital sinus
   E- ectodermal in growth in the genital tubercle

52. A septum in the uterus may develop due to a developmental fault in the:
   A- Fusion of the two Mullerian ducts  B- Fusion of the two sinovaginal bulbs
   C- Canalization of the sinovaginal bulbs  D- Aplasia of one Mullerian duct
   E- Hypoplasia of the Mullerian duct

53. Which of the five muscles of the anterior abdominal wall arises only from the ribs?
   A-External oblique      B-Internal oblique    C-Transversus abdominis
   D-Rectus abdominis      E-Pyramidalis
54. Which of the following structures is not a content of the spermatic cord?
   A- Vas deferens  B- Testicular artery  C- Pampiniform plexus of veins  
   D- ilioinguinal nerve  E- Cremasteric artery

55. Which of the following organs is retroperitoneal?
   A- The liver  B- The transverse colon  C- The spleen  
   D- The ascending colon  E- The stomach

56. A gastric ulcer in the posterior wall of the stomach is dangerous because it may erode the:
   A- Splenic artery  B- spleen  C- transverse colon  D- liver  E- aorta

57. The impression just lateral to the hilum of the spleen is:
   A- Colic  B- gastric  C- renal  D- pancreatic  E- jejunal

58. When compared with the Ileum, the upper part of the jejunum has:
   A- more plicae circularis  B- more peyer’s patches  
   C- more arterial arcades  D- more mesenteric fat  E- narrower lumen

59. Veins radiating from the umbilicus in portal hypertension involve anastomosis between:
   A-left gastric & azygos veins  B- sup. rectal & inf. rectal veins  
   C- colic & lumbar veins  D- paraumbilical & superficial epigastric veins  
   E- phrenic veins & veins of bare area of liver

60. Which of the following junctions in the GIT has a valve made of two lips?
   A- Gastroesophageal  B- Pyloroduodenal  C- Duodenojejunal  
   D- Ileocecal  E- Rectoanal

61. Cancer in which of the following may spread to the inferior mesenteric lymph nodes?
   A- First part of duodenum  B- Third part of duodenum  C- ileum  
   D- Left colic flexure  E- Lower part of anal canal

62. The common bile duct is located:
   A- Behind head of pancreas  B- Behind portal vein  C- To the left of hepatic artery  
   D- Infront of first part of duodenum  E- behind IVC

63. Which part of the duodenum is related to the neck of gall bladder?
   A- 1st inch of 1st part  B- 2nd inch of 1st part  C- 2nd part  
   D- 3rd part  E- 4th part

64. The artery behind the right ureter is the:
   D- Superior mesenteric a.  E- Bifurcation of right common iliac a.

65. The name "nervus furcalis" is given to the following lumbar nerve:
   A- L1  B- L2  C- L3  D- L4  E- L5

66. The part of the levator ani muscle that is important for stool continence is the:
   A- levator prostatae  B- puborectalis  C- pubococcygeus proper  
   D- iliococcygeus  E- sphincter vaginae
67. Which of the following is a branch of the posterior division of internal iliac artery:
   D- Internal pudendal a.   E- Uterine a.

68. Which of the following branches of the sacral plexus has the root value of S2,3,4:
   A- superior gluteal n.   B- Nerve to obturator internus   C- Pudendal n.
   D- Sciatic n.   E- Posterior cutaneous nerve of the thigh

69. The sphincter urethrae is stimulated by:
   A- Parasympathetic nerves   B- Sympathetic nerves   C- Pudendal nerve
   D- Genitofemoral nerve   E- Ilioinguinal nerve

70. Per rectal (P-R) examination in the male may not feel the following structure:
   A- prostate   B- ampulla of vas deferens   C- seminal vesicles
   D- base of urinary bladder   E- urethra

71. The ejaculatory ducts pierce the following aspect of the prostate:
   A- Apex   B- Base   C- Anterior surface
   D- Posterior surface   E- Inferolateral surface

72. The narrowest part of the uterine tube is the:
   A- fimbria   B- infundibulum   C- ampulla   D- isthmus   E- intramural part

73. During vaginal examination, the external os was in the form of a transverse slit. This woman is:
   A- Had previous deliveries   B- Virgin   C- Menopausal
   D- Menstruating   E- Pregnant

74. Runs in the center of the corpus cavernosum of penis:
   A- deep artery of penis   B- artery of bulb   C- dorsal artery of penis
   D- Dorsal nerve of penis   E- Deep dorsal vein of penis

75. The part of the musculature of the anal canal attached to the perineal body is the:
   A- internal sphincter   B- Subcutaneous external sphincter
   C- Superficial external sphincter   D- Deep external sphincter   E- Puborectalis sling

Match from 76 -80
   76- Special visceral efferent   A- Nucleus solitaries
   77- General somatic efferent   B- Mesencephalic nucleus
   78- General visceral efferent   C- Motor facial nucleus
   79- Special visceral afferent   D- Hypoglossal nucleus
   80- General somatic afferent   E- Dorsal motor nucleus of vagus

MCQ June 2013
1. The muscle supplied by two cranial nerves is the:
   A- Trapezius   B- Sternomastoid   C- Omohyoid   D- Digastric   E- Thyrohyoid
2. The sensory nerve supply of the carotid body and sinus is the:
   A- Glossopharyngeal   B- Trigeminal   C- Facial   D- Hypoglossal   E- Vagus
3. The inferior petrosal sinus connects the cavernous sinus to the:
   A- Straight sinus                B- Internal jugular vein                C- Transverse sinus
   D- Vertebral vein                E- Inferior sagittal sinus

4. The nerve that contains sympathetic fibers to dilator papillae:
   A- Oculomotor nerve              B- Short ciliary nerve              C- Lacrimal nerve
   D- Frontal nerve                E- Nasociliary nerve

5. Which of the following is present inside the parotid gland is?
   A- Motor part of facial nerve     B- Sensory part of facial nerve
   C- Parasympathetic part of facial nerve
   D- Motor and parasympathetic parts of facial nerve
   E- Parasympathetic and sensory parts of facial nerve

6. The sublingual salivary gland is related medially to:
   A- Mucosa of floor of mouth        B- Geniohyoid
   C- Mandible
   D- Mylohyoid muscle                E- Lingual nerve

7. The inferior alveolar nerve supplies:
   A- Hyoglossus muscle              B- Stylohyoid
   C- Genioglossus

8. Deep to hyoglossus muscle is the:
   A- First part of lingual artery   B- Mylohyoid muscle
   C- Lingual nerve
   D- Glossopharyngeal nerve
   E- Hypoglossal nerve

9. The first lymph node receiving lymphatic drainage from the most posterior portion of the tongue is:
   A. Submental          B. Jugulodigastric       C. Submandibular
   D. Buccal            E. Parotid

10. The anterior border of parotid gland is related to:
    A. Cervical branch of facial nerve
    B. Temporal branch of facial nerve
    C. Sternomastoid muscle
    D. Transverse facial artery
    E. Superficial temporal vessels

11. The floor of digastric triangle is formed by:
    A. Thyrohyoid and hyoglossus
    B. Thyrohyoid and mylohyoid
    C. Superior and middle Constrictors
    D. Mylohyoid and hyoglossus
    E. Middle arid inferior constrictors

12. The sensory nerve supply of oropharynx is the:
    A. Cranial accessory nerve
    B. Pharyngeal branches of glossopharyngeal nerve
    C. Pharyngeal branches of pterygopalatine ganglia
    D. Pharyngeal branches of maxillary nerve
    E. Pharyngeal branches of vagus

13. Which of the following is a tributary if internal jugular vein?
    A. Anterior jugular vein
    B. Pharyngeal veins
    C. External jugular vein
    D. Superior petrosal sinus
    E. Inferior thyroid veins
14. A 45-years-old woman is suffering from numbness over the tip of her nose. Which of the following nerves is most likely to be damaged? 
A. Trunk of mandibular nerve  
B. Anterior division of mandibular nerve  
C. Maxillary division of the trigeminal nerve  
D. Posterior division of mandibular nerve  
E. Ophthalmic division of the trigeminal nerve

15. Tearing of the attachment of the falx cerebri from the tentorium cerebelli would lead to the bleeding from which of the following venous sinuses? 
A. Occipital sinus  
B. Sigmoid sinus  
C. Superior sagittal sinus  
D. Straight sinus  
E. Transverse sinus

16. The muscle that abducts and depresses the eyeball is: 
A. Superior rectus  
B. Inferior rectus  
C. lateral rectus  
D. Superior oblique  
E. Inferior oblique

17. Difficulty in retraction of the mandible would indicate damage to the: 
A. Lateral pterygoid muscle  
B. Temporalis muscle  
C. Masseter muscle  
D. Mylohyoid muscle  
E. Medial pterygoid muscle

18. All of the following nerves exit the middle cranial fossa except: 
A. Abducent  
B. Facial  
C. Trochlear  
D. Oculomotor  
E. Trigeminal

19. The nerve that accompanies the superior thyroid artery is damaged during thyroidectomy operation. Which of the following muscle actions is affected? 
A. relaxing the vocal cords  
B. rotating the arytenoid cartilages  
C. Widening the rima glottides  
D. Tensing the vocal cords  
E. Abducting the vocal cords

20. The deep cervical artery is a branch of: 
A. Costocervical trunk  
B. Thyrocervical trunk  
C. Inferior thyroid artery  
D. Transverse Cervical artery  
E. Ascending cervical artery

21. A young girl complains of dryness of the nose and the palate. This would indicate a lesion of which of the following ganglia? 
A. Vagal ganglion  
B. Pterygopalatine ganglion  
C. Otic ganglion  
D. Submandibular ganglion  
E. Ciliary ganglion

22. The middle ethmoidal air sinus drains into the: 
A. Superior meatus  
B. Bulla ethmoidalis  
C. Inferior meatus  
D. Sphenoethmoidal recess  
E. Hiatus Semilunaris

23. Which of the following arteries is a branch of maxillary artery? 
A. Tonsillar  
B. Ascendig pharyngeal  
C. lingual  
D. Middle meningeal  
E. Suprathyroid

24. A chain of successive neurons in the CNS having the same function as called: 
A. lemniscus  
B. Commissure  
C. Tract  
D. Pathway  
E. Decussation

25. The crossed corticospinal tract occupies the: 
A. Anterior limb of internal capsule  
B. Lateral white column of spinal cord  
C. pyramid  
D. Basis pedunculi  
E. Basis pontis
26. The internal arcuate fibers in the medulla are axons of:
   A. Nucleus Solitarius
   B. superior olivary nucleus
   C. Accessory cuneate nuclei
   D. Inferior olivary nucleus
   E. Gracile & cuneate nuclei

27. The spinal dura mater ends at the vertebral level of:
   A. S1
   B. S2
   C. L1
   D. L2
   E. L3

28. The spinal cord region that has the richest blood supply is:
   A. Cervical
   B. Lumbar
   C. Sacral
   D. Lower thoracic
   E. Upper thoracic

29. A patient having paraplegia with loss of pain sensation in spite of preservation of proprioception in both lower limbs most likely has:
   A. Complete transection of the spinal cord
   B. Anterior spinal artery Occlusion
   C. Hemisection of the spinal cord
   D. Tabes dorsalis
   E. Poliomyelitis

30. The pontine cranial nerve that is not attached to the lower border of pons is:
   A. Abducent
   B. Facial
   C. Vestibular
   D. Cochlear
   E. Trigeminal

31. The medial eminence in the floor of the fourth ventricle overlies the nucleus of:
   A. Hypoglossal nerve
   B. Facial nerve
   C. Vagus nerve
   D. Vestibular nerve
   E. Abducent nerve

32. The parasympathetic nucleus of the ninth cranial nerve is the:
   A. Lacrimatory
   B. Dorsal vagal
   C. inferior salivatory
   D. Superior salivatory
   E. Ambiguus

33. The nucleus that projects neocerebellar efferent is the:
   A. Dentate
   B. Globose
   C. Emboliform
   D. Fastigial
   E. Vestibular

34. The thalamic nucleus for pain and temperature sensations of the head is the:
   A. Ventral anterior
   B. Ventral lateral
   C. posterolateral
   D. Ventral-posteromedial
   E. Lateral-dorsal

35. Match the cortical area in column (A) with its lesion in column (B):
   A. Area 17
   B. Broca's area
   C. Area 6
   D. Frontal eye field
   E. Superior parietal lobule
   A. Return of grasp reflex
   B. loss of conjugate eye deviation
   C. Astereognosis
   D. Motor aphasia
   E. Homonymous hemianopia

36. In which part of the internal capsule descend the corticonuclear fibers?
   A. Anterior limb
   B. Posterior limb
   C. Retrolentiform part
   D. Sublentiform part
   E. Genu

37. The subarachnoid cistern that does not contain blood vessels is the:
   A. Cistern of lateral cerebral fossa
   B. Cisterna pontis
   C. Cisterna ambiens
   D. Interpeduncular cistern
   E. Cisterna magna

38. The fornix connects the hippocampus with the:
   A. Amygdala
   B. Mammillary bodies
   C. Prefrontal cortex
   D. Uncus
   E. Isthmus
43. Which of the central branches of the circulus arteriosus supply the geniculate bodies?
   A. Central set    B. Anteromedial set    C. Posteromedial set
   D. Anterolateral set  E. Posterolateral set

44. The first order neurons of taste pathway from the posterior 1/3 of tongue are located in the
   A. Superior ganglion of glossopharyngeal nerve
   B. Inferior ganglion of glossopharyngeal nerve
   C. Superior ganglion of vagus nerve
   D. Inferior ganglion of vagus nerve
   E. Geniculate ganglion

45. The vessels and nerves of the anterior abdominal wall are deep to
   A. internal oblique muscle    B. External oblique muscle    C. Skin
   D. Superficial fascia    E. Transverses abdominis muscle

46. The anterior wall of rectus sheath between the xiphoid process and the umbilicus is formed by the aponeurosis of:
   A. External oblique muscle
   B. External and internal oblique muscles
   C. Internal oblique muscle
   D. Internal oblique and transverses abdominis muscles
   E. Transverses abdominis muscle

47. A direct inguinal hernia
   A. Lies inferior to the inguinal ligament
   B. Enters the deep inguinal ring
   C. Enters the femoral ring
   D. Lies lateral to the inferior epigastric vessels
   E. Lies medial to the inferior epigastric vessels

48. In front of hilum of right kidney is:
   A. Right lobe of liver    B. Ileum    C. Duodenum
   D. Colon    E. Right suprarenal gland

49. The commonest site for the appendix is:
   A. Antececal    B. Paracecal    C. Paracolic    D. Retrocolic    E. Retrocecal

50. The fundus of gall bladder lies opposite the tip of costal cartilage number:
   A. 7    B. 9    C. 8    D. 10    E. H

51. When compared with ileum, the upper part of the jejunum has
   A. More mesenteric fat    B. More payer’s patches    C. More arterial arcades
   D. More closed windows    E. More plicae circularis

52. Which of the following forms the posterior boundary of the epiploic foramen
   A. Liver    B. Aorta    C. Duodenum
   D. Lesser omentum    E. Inferior vena cava

53. The left kidney reaches upwards to the level of
   A. 10th rib    B. 10th space    C. 11th rib    D. 11th space    E. 12th rib

54. Which of the following nerves is a terminal branch of the sacral plexus
   A. Superior gluteal    B. Pelvic splanchnic    C. Pudendal
   D. Nerve to obturator internus    E. Posterior cutaneous nerve of the thigh
55. The abdominal part of the ureter lies in front of
A. External oblique muscle  B. Quadratus lumborum muscle
C. Rectus abdominus muscle  D. Psoas major muscle  E. Iliacus muscle

56. Regarding the abdominal aorta
A. It lies on the right side of the inferior vena cava
B. It bifurcates in front of the fourth lumbar vertebra
C. The first branch is the renal artery
D. It enters the abdomen in front of the 10th thoracic vertebra
E. The thoracic duct leaves the abdomen on its left side

57. Regarding the abdominal aorta
A. It lies anterior to common iliac vessels
B. It lies lateral to anterior sacral foramina
C. It has no ganglia. It gives preganglionic fibers to blood vessels
D. The two trunks unite in front of coccyx to form the ganglion impar

58. The commonest position of the uterus is
A. In line with the cervix and vagina  B. Retroverted anteflexed
C. Retroverted retroflexed  D. Anteverted anteflexed  E. Anteverted retroflexed

59. Which of the following arteries is a parietal branch of the anterior division of internal iliac artery
A. Superior gluteal  B. Uterine  C. Obturator  D. Middle rectal  E. Iliolumbar

60. The commonest site involved in senile benign enlargement of prostate is the
A. Anterior lobe  B. Posterior lobe  C. Right lateral lobe  D. Left lateral lobe  E. Median lobe

61. The structure that opens in the center of the seminal Colliculus is the
A. Ducts of prostatic glands  B. Prostatic Utricle  C. Ejaculatory duct
D. Neck of urinary bladder  E. Membranous urethra

62. The rectum
A. The peritoneum covers it completely  B. Its length is 40 cm
C. Begins opposite the 1st piece of sacrum  D. Begins opposite the 3rd piece of sacrum
E. Ends at the 5th sacral vertebra

63. The trigone of the urinary bladder in male is related posteriorly to the
A. Prostate  B. External iliac vessels  C. Levator ani
D. Anal canal  E. Seminal vesicles

64. Regarding the male urethra
A. The ejaculatory ducts open in the membranous part
B. The spongy urethra is the shortest part  C. The prostatic part is the narrowest one
D. The prostatic part is the widest part
E. The spongy part is surrounded by urethral sphincters

65. The narrowest part of the uterine tube is the
A. Isthmus  B. Fimbria  C. Ampulla
D. Infundibulum  E. Intramural part
66. Which nerve supplies the pharyngeal arch that gives rise to the styloid process  
   A. Mandibular    B. Glossopharyngeal    C. Superior laryngeal  
   D. Facial                     E. Recurrent laryngeal  

67. The pharyngeal pouch that gives lie to the palatine tonsil Is the  
   A. First            B. Second              C. Third               D. fourth            E. Fifth  

**Match the structure in column (A) with its embryonic source in column (B):**  

68. Parafollicular cells                   A. Infundibular process  
69. Lower lip                                 B. Hypobranchial eminence  
70. Vallate papillae                  C. Ultimobranchial body  
71. Secondary palate               D. Maxillary prominences  
72. Posterior pituitary           E. Mandibular prominences

73. A new born baby had attack of vomiting after cacti suckling what is the most likely  
   anomaly?  
   A. Thoracic stomach  B. Accessory pancreas  C. Reversed rotation of the stomach  
   D. Pyloric stenosis  E. Absence of gall bladder  

74. Which of the following is a derivative of the dorsal mesentery?  
   A. Falciform ligament    B. Coronary ligament     C. Triangular ligaments  
   D. Lesser omentum       E. Greater omentum  

75. Which of the following events no role role during development of the duodenum  
   A. Obliteration B. Recanalization  C. Shift of bile duct opening  
   D. Rotation 90° to the left  E. Absorption of mesoduodenum  

76. During appendectomy, the surgeon noticed that the appendix was not inflamed on  
    inspecting the ileum. he found a small blind pouch arising about 60 cm from the  
    ileocecal Junction. This anomaly is due to  
    A. Failure of obliteration of the vitellointestinal duct  
    B. Failure of absorption of the dorsal mesentery  
    C. Failure of descent of the caecum  
    D. Failure of rotation of the midgut loop  
    E. Failure of migration of the’ vermiform appendix

77. During abdominal operation, the surgeon was surprised to find that the small  
    intestine was located on the right side of the abdomen and the colon on the left side  
    This condition Is caused by:  
    A. Rotation of midgut only 90° clockwise  
    B. Rotation of midgut only 90° anticlockwise  
    C. Rotation of midgut 270° clockwise  
    D. Rotation of midgut 270° anticlockwise  
    E. Non-rotation of the midgut loop  

78. A defect in the septum separating the cloaca results in:  
   A. Rectal atresia  B. Ectopia vesicae  C. imperforate anus  
   D. urorectal fistula  E. Megacolon

79. The passage of stools from the umbilicus indicates  
   A. Patent vitellointestinal duct  B. Persistant mesentery of midgut  
   C. Reversed rotation of midgut  D. Failure of reduction of midgut  
   E. Failure of canalization of midgu
80. The ureteric bud is derived from
   A. The vesicourethral canal   B. The Mullerian duct   C. The nephron
   D. The mesonephric duct   E. The urogenital sinus

**MCQ Sept 2013**

1. The medial surface of submandibular salivary gland is related to:
   A. Mandible   B. Facial vein   C. Mylohyoid
   D. Medial pterygoid   E. Genioglossus

2. The muscle attached to medial surface of mastoid process is supplied by:
   A. Mandibular nerve   B. Facial n.   C. Cranial accessory
   D. Medial pterygoid   E. Hypoglossal n.

3. Pain from capsule of parotid gland is carried by:
   A. Auriculotemporal nerve   B. Lesser petrosal nerve   C. Facial nerve
   D. Maxillary nerve   E. Great auricular nerve

4. Bleeding in which layer of scalp causes black eye?
   A. Skin   B. Connective tissue   C. Aponeurosis
   D. Loose connective tissue   E. Pericranium

5. The floor of anterior part of carotid triangle is formed by:
   A. Mylohyoid and hyoglossus   B. Hyoglossus and thyrohyoid
   C. Thyrohyoid and mylohyoid   D. Thyrohyoid and middle constrictor
   E. Middle and inferior constrictors

6. A muscle that produces depression and intorsion of eyeball:
   A. Superior rectus   B. Inferior rectus   C. Superior oblique
   D. Inferior oblique   E. Lateral rectus

7. A tributary of cavernous sinus is the:
   A. Central retinal vein   B. Pterygoid venous plexus   C. Superior petrosal sinus
   D. Inferior petrosal sinus   E. Great cerebral vein

8. A branch from cavernous part of internal carotid artery is the:
   A. Caroticotympanic artery   B. Pterygoid artery   C. Hypophyseal artery
   D. Ophthalmic artery   E. Anterior choroidal artery

9. Parasympathetic fibers in the orbit supply:
   A. Dilator Pupillae   B. Ciliaris muscle   C. Muller’s muscle
   D. Lacrimal sac   E. Inferior oblique

10. A structure that lies between scalenus anterior and scalenus medius:
    A. Subclavian artery   B. Subclavian vein   C. Spinal accessory
    D. Lesser occipital   E. Suprascapular nerves

11. The inferior border of thyroid isthmus is related to:
    A. Superior thyroid artery   B. Inferior thyroid artery   C. Inferior thyroid vein
    D. Trachea   E. Sternohyoid and sternothyroid

12. A tributary of brachiocephalic vein:
    A. External jugular vein   B. Anterior jugular vein   C. Suprascapular veins
    D. Superior thyroid vein   E. Vertebral vein
13. A patient suffers from infection at the site of earrings, which group of lymph nodes is likely to be enlarged:
   A-Submental lymph nodes  B-Submandibular lymph nodes  
   C-Parotid lymph nodes  D-Anterior cervical lymph nodes  
   E-Superficial cervical lymph nodes

14. The space above superior constrictor contains:
   A-Stylopharyngeus muscle  B-Glossopharyngeal nerve  
   C-Auditory tube  D-Stylohyoid ligament  E-Pharyngeal raphe

15. A patient lost sensation from the soft palate, the nerve affected is:
   A-Vagus  B-Glossopharyngeal  C-Facial  D-Maxillary  E-Accessory

16. A muscle that protrudes the tongue is:
   A-Styloglossus  B-Hyoglossus  C-Genioglossus  
   D-Palatoglossus  E-Superior longitudinal muscle

17. A nerve that lies deep to hyoglossus:
   A-Lingual nerve  B-Hypoglossal nerve  
   C-Chorda tympani  D-Glossopharyngeal nerve  E-Mylohyoid nerve

18. Fibers of C1 that joins hypoglossal nerve supply:
   A-Geniohyoid and stylohyoid  B-Geniohyoid and thyrohyoid  
   C-Thyrohyoid and sternothyroid  D-Thyrohyoid and mylohyoid  
   E-Geniohyoid and omohyoid

19. Squeezing a boil on skin of nose could cause:
   A-Facial palsy  B-Diplopia  C-Loss of sensation from skin of nose  
   D-Nasal regurgitation  E-Bleeding from nose

20. A tumor in pituitary gland could spread inferiorly to invade:
   A- Diaphragma sellae  B- Optic chiasma  
   C- Cavernous sinus  D- Pons  E- Sphenoidal air sinus

21. A patient has dry eye and reduced nasal secretions, the lesion might be in:
   A-Otic ganglia  B- Ciliary ganglia  
   C- Submandibular ganglia  D- Sphenopalatine ganglia  
   E- Superior cervical sympathetic ganglia

22. Extra dural hematoma occurs due to rupture of a vessel that passes in:
   A- Foramen rotundum  B- Foramen ovale  
   C- Foramen spinosum  D- Carotid canal  E- Inferior orbital fissure

23. Dislocation of temporomandibular joint occurs due to excessive movements of:
   A- Lateral pterygoid  B- Sternohyoid  
   C- Mylohyoid  D- Masseter  E- Medial pterygoid

24. The transpyloric plane lies:
   A- Halfway between xiphoid and symphysis pubis  
   B- At the level of the hila of the kidney  
   C- At the level of the body of L2  
   D- At the level of L5  E- At the level of the L4-L5 disc
25. The deep inguinal ring is a hole in the:
   A- External oblique aponeurosis                      B- Internal oblique aponeurosis
   C- Transversus abdominis aponeurosis               D- Fascia transversalis
   E- Extraperitoneal fatty tissue

26. Which of the following structures is not present in the rectus sheath:
   A- Rectus abdominis muscle   B- Superior epigastric artery
   C- Inferior epigastric artery D- Terminal parts of lower five intercostals nerves
   E- Ilioinguinal nerve

27. The cremasteric muscle:
   A- Is formed from smooth muscle fibers
   B- Is a derivative of the external oblique muscle
   C- Is supplied by femoral branch of genitofemoral nerve
   D- Is covering the testis in male and the ovary in female
   E- Lies between the external and internal spermatic fasciae

28. Posterior relation of epiploic foramen is the:
   A- Aorta                               B- Inferior vena cava
   C- Common bile duct                   D- Hepatic artery
   E- Gastroduodenal a.

29. Regarding the celiac trunk:
   A- Arises from the abdominal aorta at the level of the 2nd lumbar vertebra
   B- Is accompanied by the celiac vein
   C- Gives off the right gastric artery as a direct branch
   D- Supplies all parts of the duodenum
   E- Gives indirect supply to the gall bladder

30. The upper part of the jejunum in comparison with ileum:
   A- Has a thinner wall                        B- Has complicated arterial arcades
   C- Has numerous plicae circulares     D- Has more aggregated lymph follicles
   E- Is less vascular

31. During splenectomy (removal of spleen) the splenic artery and splenic vein are ligated within the following peritoneal ligament:
   A- Gastrocolic ligament      B- Gastrosplenic ligament   C- Phrenicocolic ligament
   D- Lienorenal ligament       E- Falciform ligament

32. Which statement best describes the blood supply of the stomach?
   A- It’s derived entirely from the superior mesenteric artery
   B- The gastroepiploic arteries supply the lesser curvature
   C- The right gastric artery supplies the cardiac end
   D- The left gastroepiploic artery arises directly from the celiac trunk
   E- The short gastric arteries arise from the splenic artery

33. In a 75-year-old man with long history of smoking and atherosclerosis, occlusion of which arteries would result in insufficient perfusion (arterial supply) of urinary bladder:
   A- External iliac                      B- Inferior epigastric
   C- Internal pudendal                  D- Internal iliac
   E- Lateral sacral
34. Which of the following structures is closely related to the right kidney and is enlarged by adrenalectomy (removal of suprarenal gland)?
   A- Aorta                                        B- Inferior vena cava            C- Left hepatic vein
   D- Right crus of the diaphragm   E- Right renal artery

35. Which of the following vessels is behind the right kidney and may be endangered during nephrectomy?
A- Obturator   B- Superior mesenteric   C- Renal   D- Gonadal   E- Subcostal

36. The inferior mesenteric artery arises from the abdominal aorta immediately posterior to the following organs:
A- First part of the duodenum   B- Head of pancreas   C- Neck of pancreas
D- Second part of duodenum     E- Third part of duodenum

37. The commonest site of the vermiform appendix is:
A- Retrocecal   B- Paracecal   C- Pelvic   D- Subhepatic   E- Preileal

38. A sharp object penetrating the wall of posterior fornix of vagina will reach:
A- Deep perineal pouch   B- Ischiorectal fossa   C- Rectovaginal pouch
D- Rectovesical pouch   E- Vesicouterine pouch

39. In prostatic hypertrophy, the following structure is enlarged:
A- Interrueteric crest   B- Prostatic utricle   C- Seminal colliculus
D- Sphincter urethrae   E- Uvula vesicae

40. The female ureters:
A- Run posterior to the bifurcation of common iliac arteries
B- Run anterior to the ovaries
C- Run forwards and medially above the root of the broad ligament
D- Run posterior to the internal iliac arteries
E- Are closely related to lateral fornices of the vagina

41. Regarding the pelvic part of sympathetic trunk:
A- It lies anterior to common iliac vessels
B- It lies lateral to anterior sacral foramina
C- It has 3 ganglia
D- The two trunks unite in front of coccyx to form the ganglion impar
E- Its ganglia gave white rami communicantes to sacral nerves

42. All are true about the trigone of the bladder except:
A- Mucosa is loosely attached to the underlying musculature
B- Mucosa is thin and smooth   C- Mucosa is sensitive and vascular
D- Derived from absorbed part of mesonephric duct
E- Distance between two ureteric orifices is about 5 cm in the full bladder

43. All of the following drain into the superficial inguinal lymph nodes except:
A- Lower part of the urethra   B- Lower part of the vagina   C- Scrotum
D- Ovaries   E- Lower part of the anal canal

44. All the following ligaments are supporting mechanisms of uterus except:
A- Uterosacral ligament   B- Broad ligament
C- Mackenrods (transverse cervical) ligament   D- Round ligament
E- Pubovesical ligament
45. The artery to the ductus deferens is a branch of:
   A- Inferior epigastric  B- Superior epigastric  C- Superior vesical
   D- Cremasteric a.  E- Middle rectal

46. In an adult male, on rectal (per rectal-PR) examination, all of the following
   structures can be felt anteriorly except:
   A- Internal iliac lymph nodes  B- Bulb of penis  C- Prostate
   D- Seminal vesicle when enlarged  E- Base of bladder

47. A patient with external hemorrhoids develops pain while passing stools, the nerve
   mediating this pain is:
   A- Inferior hypogastric nerve  B- Pudendal nerve  C- Splanchnic visceral nerve
   D- Sympathetic plexus  E- Superior hypogastric nerve

48. The artery supplying the midgut region is the:
   A- Superior mesenteric  B- Inferior mesenteric  C- Celiac trunk
   D- Hepatic  E- Splenic

49. What are the two structures that develop from the ventral aspect of the hepatic
   bud?
   A- Liver, Pancreas  B- Liver, Gall bladder  C- Pancreas, Gall bladder
   D- Duodenum, Liver  E- Duodenum, Pancreas

50. Between week 6 and week 10, the midgut undergoes overall (total) rotation of:
   A- 90 degrees  B- 180 degrees  C- 270 degrees  D- 300 degrees  E- 360 degrees

51. To which of the following structures Meckel’s diverticulum is associated?
   A- Duodenum  B- Jejunum  C- Ileum  D- Transverse colon  E- Sigmoid colon

52. The urinary system develops mainly from:
   A- Ectoderm  B- Paraxial mesoderm  C- Intermediate mesoderm
   D- Lateral plate mesoderm  E- Endoderm

53. In which of the following regions the first kidney develops?
   A- Cervical  B- Thoracic  C- Lumbar  D- Sacral  E- Cloaca

54. The urorectal septum is in between:
   A- Anorectal canal, Urogenital sinus  B- Urogenital sinus, Mesonephric duct
   C- Urinary bladder, Allantois  D- Urachus, Allantois
   E- Mesonephric duct, Ureteric bud

55. During the 4th week of development, in what region does the branchial apparatus
   develop?
   A- Head  B- Neck  C- Thorax  D- Abdomen  E- Pelvis

56. Which two bones develop from the first arch?
   A- Malleus and Incus  B- Malleus and Stapes  C- Incus and Stapes
   D- Incus and Styloid process  E- Styloid process and malleus

57. Which pharyngeal pouch gives the structure that allows you to equalize the
   pressure in your ears by blowing into a pinched nose?
   A- First  B- Second  C- Third  D- Fourth  E- Sixth

58. The primary palate forms the premaxilla that holds:
   A- Molars  B- Premolars  C- Incisors  D- Canines  E- Wisdom teeth
59. What type of facial anomaly would start at the lip and extend to the orbit?
   A- Oblique facial cleft  B- Median cleft  C- Cleft lip
   D- Anterior cleft  E- Posterior cleft

60. The posterior wall of Rathke’s pouch gives:
   A- Pars distalis  B- Pars tuberalis  C- Pars intermedia
   D- Pars nervosa  E- Infundibulum

61. A bundle of nerve fibers in the CNS having the same beginning, termination and function is called:
   A- Pathway  B- Tract  C- Lemniscus  D- Commissure  E- Decussation

62. The tube of spinal dura-arachnoid ends at the level of:
   A- 1st lumbar  B- 3rd lumbar  C- 1st sacral  D- 2nd sacral  E- 1st coccygeal

63. The ability to recognize an unseen familiar object placed in the hand depends on integrity of which tract?
   A- Lateral spinothalamic  B- Ventral spinothalamic  C- Spinocerebellar
   D- Cuneo-cerebellar  E- Dorsal column

64. Regarding the medulla oblongata, the medial zone containing the pyramid is supplied by:
   A- Posterior spinal artery  B- Anterior spinal artery
   C- Posterior inferior cerebellar artery  D- Basilar artery
   E- Posterior cerebral artery

65. Which of the following nuclei represent the somatic efferent column?
   A- Abducent nucleus  B- Nucleus solitaries  C- Nucleus ambiguous
   D- Dorsal vagal nucleus  E- Motor nucleus of trigeminal

66. The inferior cerebellar peduncle contains:
   A- Dentatothalamic tract  B- Gracile tract  C- Anterior spinocerebellar tract
   D- Posterior spinocerebellar tract  E- Cortico-ponto-cerebellar fibers

67. The flocculo-nodular lobe of the cerebellum is concerned with:
   A- Voluntary movements  B- Equilibrium  C- Reflexes
   D- Muscle tone  E- Involuntary movements

68. Which of the following thalamic nuclei projects to the cingulated gyrus?
   A- Anterior  B- Ventral lateral  C- Ventral posterior lateral
   D- Pulvinar  E- Lateral geniculate

69. Motor aphasia occurs in lesion of:
   A- Frontal lobe  B- Parietal lobe  C- Temporal lobe  D- Occipital lobe  E- Insula

70. The caudate and putamen together form the:
   A- Striatum (neostriatum)  B- Pallidum (paleostriatum)  C- Basal nuclei
   D- Globus pallidus  E- Corpus striatum

71. Which of the following is made by association fibers?
   A- Internal capsule  B- Cingulum  C- Anterior commissure
   D- Forceps minor  E- Tapetum
72. The cerebral aqueduct of Sylvius connects:
   A- Third and fourth ventricles  
   B- Lateral and 3rd ventricles  
   C- Lateral and 4th ventricles  
   D- Fourth ventricle and subarachnoid space  
   E- Fourth ventricle and central canal

73. A lesion in the anterior cerebral artery would most likely lead to inability to:
   A- Smile  
   B- Whistle  
   C- Swallow food  
   D- Clench the hands  
   E- Climb the stairs

74. A patient who can’t see the lateral halves of the eye fields likely has a lesion in:
   A- Optic nerve  
   B- Optic chiasma  
   C- Optic tract  
   D- Lateral geniculate body  
   E- Primary visual cortex

75. The fornix ends in the:
   A- Thalamus  
   B- Mammillary bodies  
   C- Substantia nigra  
   D- Lenticular nucleus  
   E- Amygdaloid nuclei

Choose the nucleus from column B that suits the statement in column A:

   A  
   76. Parotid  
   77. Muscles of tongue  
   78. Heart  
   79. Taste  
   80. Proprioception  

   B  
   76. A- Nucleus solitaries  
   77. B- Mesencephalic nucleus  
   78. C- Inferior salivatory nucleus  
   79. D- Hypoglossal nucleus  
   80. E- Dorsal motor nucleus of vagus

Essay June 2013
Cases
Case(1):-
A patient presented with a red, swollen and painful right eye. The movements of the right eye were painful and the pupil of that eye was fixed and dilated. CT scan showed thrombosis of the cavernous sinus.

1. Define the venous sinus & its functions? (2 marks)
2. Describe the site and contents of the cavernous sinus. (4 marks)
3. Define the dangerous area of the face. Explain why this area is dangerous? (2 marks)
4. Name the veins terminate in the cavernous sinus. (3 marks)

Case(2):-
A 54 years old man presented with a tumor in the posterior cranial fossa. The neurologist wanted to check the integrity of the 9th, 10th and 11th cranial nerves.

1. How can you test for integrity of vagus nerve? (1 mark)
2. Enumerate sensory branches of glossopharyngeal nerve. (2 marks)
3. Name the muscle(s) supplied by the accessory nerve. (3 marks)
Case(3):-  (7marks)
An old man had right side hemiplegia sparing the distal part of lower limb follow-
ing a stroke. Neurological examination & investigation diagnosed intracerebral
hemorrhage that interrupted the blood supply to the frontal and parietal lobes.
1. List the functional areas of the parietal lobe. (4marks)
2. Would you expect the speech to be affected in this patient? State why? (2marks)
3. Which cerebral artery was involved? (1mark)

Case(4):- (7marks)
A 27 years old man was admitted to the surgical ward with hematemesis (vomiting
blood). After resuscitation, clinical investigations had diagnosed portal
hypertension.
1. Explain the cause of hematemesis in this case. (1 mark)
2. List other site(s) could be involved in such case. (2 marks)
3. Describe formation, course & termination of the portal vein. (4 marks)

Short Essay:
1. 1-Enumerate the derivatives of mesonephric duct. (4 marks)
2. 2-Mention boundaries and floor of carotid triangle of the neck. (4 marks)
3. 3-Name the tract(s) carrying touch sensations of the face. (3 marks)
4. 4-List structures related to the first part of duodenum. (4 marks)
5. 5-Describe the blood supply of urinary bladder. (4 marks)

Essay Sept 2013
1. A young inexperienced doctor opened a parotid abscess by making a vertical
incision, the patient became unable to raise the eyebrow on the operated side.
a) Which nerve was injured? Specifically, mention the branch that was cut. (2 mark)
b) What could the doctor do to avoid the lesion? (1 mark)
c) What are the structures present within the substance of the parotid gland?
Mention how they enter and leave the gland. (3 marks)
d) Mention the surface anatomy of the parotid duct. (1 mark)

2. A 50-year-old male started to complain from difficulty in swallowing few
weeks ago. He had a computerized tomography scan (CT scan) on the neck
done, it revealed the presence of a swelling (most likely cancer) near the jugular
foramen.
(a) In this patient, which nerves could be involved and led to dysphagia? (3 marks)
(b) Which venous sinuses are endangered by the cancer? (1 mark)
(c) Describe the sensory and motor supply of the pharynx. (3 marks)

3. A 70-year-old man suddenly developed right sided hemiplegia with aphasia, he
could move his foot weakly but was unable to close his fist at all on the affected
side. Magnetic resonance imaging (MRI) proved the occurrence of cerebral
embolism.
4. A 25-year-old patient had an operation under spinal anesthesia. During recovery, he could not feel the back of his lower limb with difficulty in climbing the stairs by the right foot.
   (a) If the site of lumbar puncture was correct and the spinal cord was not injured, what else could have been injured? (1 mark)
   (b) Where is the correct site for doing a lumbar puncture? (1 mark)
   (c) Where does the spinal cord normally end in such a patient? (1 mark)
   (d) What is the level of termination of the spinal meninges? (2 marks)

5. A 40-year-old lady developed pain in the right shoulder. Her doctor noticed that she feels pain when he touches a certain point in the upper right part of her abdomen. She had ultrasonography that showed the presence of multiple small gall bladder stones. After few months she developed obstructive jaundice.
   (a) Explain the pain in the right shoulder. (1 mark)
   (b) Locate the point of maximum pain in the abdomen in this patient. (1 mark)
   (c) What is the length of the common bile duct? (1 mark)
   (d) Describe the course and termination of the common bile duct. (4 marks)

6. A 60-year-old man observed fresh blood on passing stools. On rectal examination, the doctor discovered cancer rectum.
   (a) If the cancer spreads anteriorly, which structures may be invaded? (2 marks)
   (b) Which artery causes bleeding of the cancer if it is limited to the mucosa? (1 mark)
   (c) If the cancer spreads along lymphatics, which groups may be involved? (2 marks)

7. (a) Enumerate the derivatives of the pharyngeal arch supplied by the facial nerve. (4 marks)
   (b) List the derivatives of the dorsal and ventral mesogastria. (4 marks)

**Essay June 2014**

Answer All questions - please answer each question or case in a separate page & in the same order as they are listed below:

**short essay questions (5 marks each):**
1. Describe the nerve supply of the larynx.
2. List the structures seen in the floor of the 4th ventricle.
3. Compare between the jejunum and the ileum.
4. Describe the anatomy of the anal sphincters.
5. Discuss the fate of the mesonephros in the male.

**Problem solving questions (5 marks each):**
6. During surgical removal of the thyroid gland, a ligature slipped from the superior thyroid artery. To stop the bleeding, the surgeon blindly compressed the artery with a forceps. Later, the patient spoke with husky voice.
   a. From your anatomical knowledge, explain the reason to the husky voice.
   b. Enumerate the veins draining the thyroid gland & their termination.
7. A 50-year-old hypertensive woman suddenly developed loss of sensation and weakness in her right hand.
   a. Occlusion of which cerebral artery can cause this? Explain.
   b. Where does this artery arise from?
   c. What are the deep structures supplied by its central branches?

8. A 40-year-old man discovered a swelling in his right groin that bulges out on coughing. His doctor noticed that the swelling did not reach the scrotum. He also noticed an old appendicectomy scar. He told the patient that a fault in the appendicectomy might have caused his groin swelling.
   a. From your anatomical knowledge, which type of inguinal hernia the patient is having? Explain the reason for your diagnosis.
   b. What had probably been injured during the appendicectomy? How could it lead to this hernia?

9. A married couple brought their one-year-old child to the doctor complaining that his right scrotum was empty while the left side contained a testis. The doctor searched several superficial sites that could probably contain the missing testis.
   a. If none of the examined sites contained the testis, what is the likely diagnosis? What would the diagnosis be if the testis was found in any of these sites (for example, in the root of the penis)?
   b. What is the role of the gubernaculum in either case?
   c. List two more sites that the doctor searched.

10. While riding a bicycle, a 24-year-old man fell and his perineum hit the bar of the bicycle strongly. Later, he did not pass urine, few drops of blood passed out from his external urethral meatus and painful swelling of his lower part of the anterior abdominal wall that did not extend into the thighs was noticed. A diagnosis of ruptured urethra was made.
    a. Which part of the urethra is likely injured?
    b. What prevents extension of the swelling down the thighs?
    c. Name three other sites where the swelling would extend to.

**Answers**

(1) pg 6 (bregma + clinical significance of fontanelles)
(3) pg 17 (occipito-frontalis muscle)
(4) Venous drainage pg 19 (scalp) or pg 24 (face), surgical significance: they communicate with intracranial venous sinuses by emissary veins so they may be the routes for spread of infection from outside to the cranial cavity,

**Examples:**
- Parietal emissary vein connects veins of scalp with superior sagittal sinus.
- Dep communications of anterior facial veins pg 24.
(5) pg 24 (6) Posterior auricular and occipital arteries
(7) Skin of external nose is supplied by:
-external nasal n. (branch of anterior ethmoidal of nasociliary of ophthalmic)
-infratrochlear n. (branch of nasociliary of ophthalmic) to the sides
-infraorbital n. (continuation of maxillary n.) to the ala

(9) Layers of scalp pg 16, 17, 18,, nerve supply pg 21
(10) Leaves the lower end of parotid then divides into anterior & posterior divisions
; the anterior division + anterior facial vein form common facial v. which ends in IJV & the posterior division + posterior auricular v. form EJV
(12) After it exits the skull through the stylomastoid foramen, the facial nerve gives
off the posterior auricular nerve which innervates the postauricular muscles and
occipital belly of occipito-frontalis, muscular branches which innervate the
stylohyoid muscle and posterior belly of the digastric muscle
  - Then the facial nerve crosses lateral to the styloid process and penetrates the
parotid gland. In the parotid gland, it forms the pes anserinus then divides into 5
terminal branches: Temporal, Zygomatic, Buccal, Marginal mandibular &
Cervical, it innervates 14 of the 17 paired muscle groups of the face on their deep
side as orbicularis oris and buccinator.
  - Injury at this site leads to motor paralysis of muscles of facial expression.
(13) Superior & inferior labial arteries to upper and lower lips, lateral nasal to ala
of nose, angular to medial angle of the eye, small muscular branches
(18,19,20) Parotid gland pg 29, 30, 31, 32, 33 is important…
(22) Cavernous sinus pg 42, 43 (door awal 2013)
(23) pg 46(28) pg 92,93,94(31) pg 90,91
(32) Motor nerve supply of tongue: all muscles of the tongue are supplied by
hypoglossal n. except palatoglossus which is supplied by cranial accessory n.
joining vagus through pharyngeal plexus.
Sensory: (general): anterior 2/3 via lingual n., posterior 1/3 and vallate papillae via
glossopharyngeal n., most posterior part via vagus via internal laryngeal n.
(special): anterior 2/3 via chorda tympani branch of facial n., posterior 1/3 &
vallate via glossopharyngeal, most posterior part via vagus via internal laryngeal n.

38-(CASE):
a- Because the wall of arteries adhere to the connective tissue septa which prevent
them from contraction or retraction
b- By pressing on the wounded artery…c-pg 18
d- The loose connective tissue layer, as it allows spread of infection from the scalp
to the cranial cavity through emissary veins

39-(CASE):
a- On the summit of sublingual papilla at the side of frenulum of tongue
b- The lingual n. hooks around the duct from lateral to medial
c- pg 94 (via submandibular ganglion)
d- Submandibular fossa of mandible, insertion of medial pterygoid m. & facial a.
separating them from the gland

40-(CASE):
a- A weak area in the skull, lies 4 cm above the middle of zygomatic arch and 3
and 1/2 cm behind fronto-zygomatic suture, formed by frontal, parietal, temporal
and greater wing of sphenoid bones.
b- Because the middle meningeal artery enters the skull above the middle of zygomatic arch, terminates into 2 terminal branches 2cm above the middle of zygomatic arch so fracture in the area of pterion will lead to injury of a branch of the middle meningeal a. (the frontal branch) which will lead to accumulation of blood causing extradural hematoma which may lead to contralateral hemiplegia.

41-(CASE):
1-The main arterial supply is the maxillary artery.
2-The main nerve is the mandibular nerve
Branches: From the trunk: Nervus spinosus, nerve to medial pterygoid which supplies medial pterygoid, tensor palate and tensor tympani.
   From anterior division: buccal nerve, nerve to lateral pterygoid, nerve to masseter and nerve to temporalis.
   From posterior division: auriculotemporal nerve, lingual nerve and inferior alveolar nerve
3-Loss of taste sensation due to affection of chorda tympani which joins lingual n. The nucleus that receives taste sensation is the nucleus solitarius.

42-(CASE):
a-Temporomandibular joint, synovial condylar.
b-Ligaments pg 85, the most important functionally is the lateral temporomandibular ligament as it prevents posterior dislocation of head of mandible.
c-Auriculotemporal and masseteric nerves.

**Neck**

(4) Boundaries and contents of any triangle (pg 16→pg 25, pg 30, 31) are important (carotid triangle door awal 2013)
(6) Distribution of any nerve and test of its injury (pg 39→pg 45) (vagus and glossopharyngeal door awal 2013) (8) Branches of subclavian a. pg 47

**Beginning**: sternoclavicular joint of both sides

**End of its first part**: medial to scalenus anterior muscle

(9) Carotid sheath pg 15

(10) Thyrocervical trunk is a branch of 1st part of subclavian a., it gives: inferior thyroid a., transverse cervical a., suprascapular a.

(12) Jugular veins pg 55, 56, 57, 58 (relations ml3’eyya) (13) pg 72

(16) -Motor n. supply of tensor palati: nerve to medial pterygoid (a branch of mandibular nerve trunk)
   - Thyrohyoid: C1 fibers that accompany hypoglossal n.

(17) -Pharynx: pg 80 - Larynx: pg 91

**CASES**:
1-1-As thyroid gland is invested by the pretracheal layer of deep cervical fascia which attaches the gland to the trachea and larynx.
2-Parathyroid glands, during ligation of superior thyroid a. the superior laryngeal branch of vagus could be injured, during ligation of inferior thyroid a. the recurrent laryngeal branch of vagus could be injured.
3-pg 34 (arterial supply and venous drainage)  4-pg 39

5- Hyoglossus: **Action:** depression of tongue during swallowing  
**Nerve supply:** Hypoglossal nerve

-Sternohyoid: **Action:** depression of hyoid bone (after its elevation during swallowing and vocal movements)  
**Nerve supply:** ansa cervicalis

-Lateral pterygoid: **Action:** depression, protrusion and (side to side movement of mandible together with medial pterygoid)  
**Nerve supply:** pterygoid branch of anterior division of mandibular nerve

-Inferior oblique of eye: **Action:** Elevation, abduction and extorsion of eyeball  
**Nerve supply:** inferior division of occulomotor n.

- Sternocleidomastoid: **Action:** acting on one side: tilting the head to its own side and so rotating the face to the opposite side. Acting on both sides: flex the head anteriorly, act during forced inspiration  
**Nerve supply:** Motor: spinal accessory n.  
Sensory(proprioceptive): ventral ram of C2 & C3

2-1- Torticollis  2- Left sternocleidomastoid muscle

3- Nerve supply: Motor: spinal accessory n. Sensory(proprioceptive): ventral ram of C2 & C3  4- Trapezius muscle

3-1- Common carotid a.  2-3rd arch

3- Opposite disc between C3 and C4, at the upper border of thyroid cartilage.  4- Internal jugular vein is lateral to it.

5- Carotid sinus (contains baroreceptors for controlling ABP)  
-Carotid body (acts as chemoreceptor controlling O2 and Co2 contents of the blood)

4-1- The thyroid swelling moves up and down with swallowing because it is invested by pretracheal layer of the deep cervical fascia. (1 mark)

2- The thyroid swelling cannot extend up beyond the oblique line of the thyroid cartilage due to attachment of infrahyoid (sternothyroid) muscles. (1 mark)

3- Changes of voice occur due to injury of external laryngeal nerve (supplies cricothyroid muscle) during ligation of superior thyroid artery. Injury of recurrent laryngeal nerve which supplies other laryngeal muscles occurs during ligation of inferior thyroid artery. Muscle cramps occur due to removal of the parathyroid glands during thyroideectomy. (3 marks)

4- Two congenital anomalies of thyroid gland: any two (2 marks)
  a. Agenesis of the gland.
  b. Incomplete descent; the gland may be found at any point between the base of the tongue and the trachea (e.g. lingual thyroid).
  c. Thyroglossal cyst

5-1- Subclavian artery (2nd part) lies between scalenus anterior and medius.  
2- The brachial plexus and subclavian artery pass between the scalenus anterior and medius. The subclavian vein and phrenic nerve pass anterior to the scalenus anterior. (pg 64)

6-1- Inferior thyroid a.  2- Recurrent laryngeal branch of vagus n.

3- **Motor:** All intrinsic muscles of larynx except cricothyroid (the muscles are: Posterior and lateral crico-arytenoid, transverse and oblique arytenoids, thyroarytenoid, aryepiglottic and thyroepiglottic muscles)
Sensory: mucosa below vocal cords.
4-Paralysis of all the previous muscles causing changes in voice and muscle cramps , loss of sensation in mucosa below vocal cords.
7-a-Maxillary air sinus.
b-Because: drainage is difficult as its drainage orifice lies near the roof , discharge from an infected frontal or anterior ethmoidal air sinus can reach it , also because it’s closely related to teeth so spread of infections from teeth reach the sinus.
c- As during sleep (lying down) drainage will be more difficult
d-Infraorbital and superior alveolar ns.

Neuroanatomy

Spinal cord:-
(3,4) From body , lateral spinothalamic t. pg 20 , from face trigemino-thalamic t. pg 21
(5) Gracile t. pg 18(6) pg 24,25
(9) Gracile & cuneate tracts pg 18 – cuneocerebellar t. pg 19(10) pg 26
(11) Hemisection of spinal cord pg 29 (Important MCQ)
(12) pg 28 (NB: cervical segements depend more on anterior and posterior spinal arteries)

Brain stem:-
(pg 42→pg 46) very important (type of fibers in each nerve, nuclei, distribution)
(8) pg 48 (very important)

Cerebral hemispheres:-
Each lobe and the functional areas in it (pg 66 → pg 70) very important
(9) Blood supply of internal capsule pg 77
Blood supply of the brain (pg 85→89) very important
Special sensory pathways (most important are taste and visual)

CASES:
1-1-Syringomyelia.
2-Due to degeneration of crossing fibers of lateral spinothalamic t. carrying pain and temperature sensations.3-Cervical and upper thoracic segments.
2-(2012 , June 2013)
1-Left middle cerebral a.2- pg 68, 69
3-Yes, as the left hemisphere is the dominant and it contains the speech areas broca’s and Wernicke’s.
3-1-In the posterior part of inferior surface of thalamus.
2-Auditory radiation to the auditory area of cortex.
4-1-Interventricular foramen of Monro.2-pg 84
3-Superior sagittal sinus → confluence of sinuses → right transverse sinus →right sigmoid sinus →right internal jugular vein.
5-1-Occlusion of posterior inferior cerebellar a. which supplies the lateral part of medulla oblongata.2-pg 48

Abdomen
(1) Inguinal canal pg 23,24,25,26(2) Pg 74,75(3) Pg 30,31,32(4) Pg 38,39
(5) Pg 44,45,46,47,48 (structures forming stomach bed = posterior relations of stomach)
(6) Peritoneal coverings and relations in Pg 52,53 , blood supply: rt gastric a. , rt gastroepiploic a. , supraduodenal a.
(7) Pg 82,83,84
(8) , (9) Pg 101,102,103 – blood supply pg 104
(10) Pg 77,78 – sites of porto-systemic anastomosis pg 81
(11) Pg 111,112

CASES:
12-a-In the rt iliac fossa ,the base of the appendix is represented on the anterior abdominal wall by Mc Burney’s point which lies at the junction of the lateral 1/3 and medial 2/3 of a line extending from the rt ASIS to the umbilicus. It lies 2 cm below the iliopectineal junction.

b-Retrocaecal
c- In the rt iliac fossa ,the base of the appendix is represented on the anterior abdominal wall by Mc Burney’s point which lies at the junction of the lateral 1/3 and medial 2/3 of a line extending from the rt ASIS to the umbilicus. It lies 2 cm below the iliopectineal junction.

d-External abdominal oblique muscle
e-Around the umbilicus: As the veriform appendix is also supplied by T10 segment (in addition to sympathetic plexus around SMA) which supplies the skin around the umbilicus.

In the rt iliac fossa; due to irritation of the parietal peritoneum.

13-a-Structures forming the stomach bed (posterior relations of stomach pg 44 , 45)

b-Splenic a.
c-Pe 48

14-a- Jejunum (or descending colon.)

b-Parts of greater omentum , stomach
c- Comparison between jejunum and ileum pg 59 , comparison between small & large intestine pg 61.

15-a-T10

b-External iliac lymph nodes → Common iliac lymph nodes → Lateral aortic lymph nodes → Cisterna chilii → Thoracic duct

16-1-Direct inguinal hernia

2-Inguinal as it was seen above the medial end of inguinal ligament , direct as it didn’t descend to the scrotum. It happened due to old age and chronic cough.

3-Medially: lateral border of rectus abdominis.

Laterally: inferior epigastric a.

Inferiorly: inguinal ligament

4-From behind forwards:

- Fascia transversalis along its whole length.
- Conjoint tendon in its medial 1/2
- Reflected part of inguinal ligament in its medial 1/4

17-1-As the bile duct is lodged or completely embedded within the substance of head of pancreas so it’s obstructed by the head enlargement due to cancer.2-Pg 86

Pelvis

(1) Pg 13,14 (2) Pg 14 (3) Pg 19 (4) Pg 28,30,31
(5) Relations of the base of urinary bladder in female & male pg 32
(6) Surfaces and relations of urinary bladder pg 33,, development: special embryology pg 87 (the summary)
(8) Abdomen: Pg 30,31,32           (9) Prostate pg 43,44,45
(10) Ovary pg 46,47,48              (11) Uterine tube pg 48,49
(12) Uterus pg 50,51,52,53,54,55,56,57
(13) Broad ligament of the uterus (Important) pg 53,54,55

CASES:
1- Infranar (pudendal) n.
2- External rectal (perimuscular) venous plexus which lies outside the external anal sphincter and communicates with the internal plexus.
3- It begins at the recto-anal junction one inch below and infront of tip of coccyx , It’s directed downwards and backwards from the recto-anal junction to the anus , It’s about 2.5→4 cm in length.
2- The penile part at its junction with the membranous part of the urethra.
2- Urethral sphincter (sphincter urethrae)
3- Mucosa of posterior wall of prostatic urethra presents:
   - Urethral crest in the middle , on each side of it there’s a prostatic sinus containing openings of ducts of prostate.
   - At the middle of the urethral crest there’s an elevation called seminal colliculus containing prostatic utricle in the middle and openings of ejaculatory ducts on each side
4- Prostatic and membranous urethrae→ internal iliac lymph nodes , penile urethra to the deep inguinal lymph nodes and few vessels pass to the superficial lymph nodes.

Embryology
*Development of Head and Neck:
(1,2,3) Pg 110 (4) Pg 114 (5) Pg 112,113 (6) Pg 125
(7) Pg 122 , anomalies: cleft palate pg 123 (8) Pg 116
(9) - The 2 lateral parts are derived from the maxillary prominences , the philtrum is derived from the frontonasal prominence (the fused medial nasal folds – the intermaxillary segment)
   - Anomalies: Cleft lip pg 123 (10) Pg 117
*Development of spinal cord:
- Histogenesis of neural tube pg 128,129, the spinal cord pg 130,131
*Development of GIT:
(1) Cloaca pg 75, anal canal pg 76 (2) Pg 66,67 (3) pg 75 (partitioning of cloaca)
*Development of Urogenital system:
(2) Urinary bladder pg 86,87
* Enumerate derivatives of mesonephric duct pg 80 (June 2013)
CASES:
1- Patent urachus (urachal fistula) 2- Summary pg 87
3- From the vesical portion of the primitive urogenital sinus
2- Branchial cyst 2- From 1st pharyngeal cleft
3- Epithelium of thymus : from ventral part of 3rd pharyngeal pouch ,, also part of thymus is derived from ventral part of 4th pharyngeal pouch
3- Rachischisis is failure of the neural tube to close
Anomalies of spinal cord pg 132

**MCQ 2011**


**MCQ 2012**


**June 2013**

**Case 1:**- 1-Venous sinuses are: venous channels lying between the 2 dural layers, they are lined by endothelium, have no muscular walls and valveless.
Functions: drain brain, meninges, bones & CSF, connected to extracranial veins via emissary veins that drain finally to the IJV (to neutralize the pressure inside the cranial cavity).
2-Cavernous sinus:
* Site:- Anteriorly: extends to the medial end of the superior orbital fissure & the apex of orbit.
   - Posteriorly: extends to the apex of petrous temporal bone and crus cerebri of midbrain.
   - Medially: pituitary gland and sphenoidal air sinus.
   - Laterally: temporal bone.
   - Superiorly: optic tract and ICA.
   - Inferiorly: foramen lacerum.
* Contents:- In the lateral wall from above downwards: oculomotor, trochlear, ophthalmic and maxillary nerves.
   - In the centre: ICA with its sympathetic plexus and abducent nerve inferolateral to the artery.
3-Dangerous area of the face is: the triangular area of skin including the upper lip, nose and medial angles of the eye.
   - It’s dangerous because if this area is infected, the infection would spread to the cavernous sinus causing its thrombosis.*Ex: squeezing a boil on the skin of the nose.
4-Veins terminate into the cavernous sinus:
   - Superior ophthalmic, inferior ophthalmic veins and central vein of the retina from the orbit.
   - Superficial middle cerebral vein and inferior cerebral vein from the brain.
   - Sphenoparietal sinus and frontal trunk of the middle meningeal vein from the meninges.
Case 2:
1. Test for integrity of vagus nerve: examining the palatal arches on both sides, on paralysis there’s no arching and uvula is deviated to the normal side.
2. Sensory branches of glossopharyngeal nerve:
   - SVA fibers (the middle part of nucleus solitarius) carrying taste sensation from the posterior 1/3 of tongue and circumvallate papillae.
   - GVA fibers (spinal nucleus of trigeminal) carrying general sensation from the oropharynx, posterior 1/3 of tongue, palatine tonsils, auditory tube and middle ear.
3. Muscles supplied by cranial accessory nerve:
   * Its Cranial part unites with vagus and supplies:
     - Stylopharyngeus muscle & other muscles of pharynx through pharyngeal branch of vagus.
     - All muscles of the palate except tensor palati. (it supplies levator palatı, musculus uvulae, palatoglossus & palatopharyngeus)
     - Muscles of larynx through recurrent laryngeal branch of vagus except cricothyroid. (it supplies posterior & lateral crico-arytenoid, transverse & oblique arytenoids, thyro-arytenoid, ary-epiglottic & thyro-epiglottic muscles)
   * Its spinal part supplies: sternomastoid and trapezius muscles.

Case 3:
1. Functional areas of the parietal lobe:
   - Somatosensory area I-Somatosensory area II-Taste (gustatory) area 43
   - Stereognosis centre-Most of part of Wernicke’s area 40,39
2. The speech will be affected in this patient as the dominant hemisphere (which is usually the left one) is damaged, which contains the sensory speech area of Wernicke in the supramarginal and angular gyri of parietal lobe, the patient cannot understand spoken or written words but speaks fluently (wrong words).
3. Middle cerebral artery.

Case 4:
1. Cause of hematemesis:
   There’s a porto-systemic anastomosis in the wall of abdominal oesophagus between the oesophageal tributaries of the left gastric vein (portal) and those of the azygos and accessory hemi-azygos veins (systemic), so portal hypertension leads to engorgement of these veins which lead to hematemesis.
2. Other sites could be involved:
   - Rectal and anal canal walls: anastomosis between superior rectal vein (portal) and middle & inferior rectal veins (systemic) ➔ hemorrhoids.
   - At the umbilicus: connections between the paraumbilical veins to the left branch of portal vein (portal) and superficial epigastric vein ➔ the caput medusae.
   - At the bare area of the liver, the posterior abdominal wall or rarely in the liver due to patent ductus venosus connected to the left branch of portal vein.
3. Portal vein:
   * Formation: Behind the neck of pancreas at the level of L1,L2 (pyloro-duodenal junction) by union of superior mesenteric and splenic veins.
   * Course: Ascends infront of IVC upwards & a little to the right first behind the neck of the pancreas, next behind the 1st part of duodenum and lastly in the free margin of lesser omentum.
Termination: In the porta hepatis by dividing into right and left branches ending into right and left lobes of liver.

**Short Essay:-**

1-Derivatives of mesonephric duct:-

*In male:*-The blind upper end → appendix of the epididymis.
- The caudal most part → the ureteric bud, the trigone of urinary bladder and the back of prostatic urethra above the ejaculatory ducts.
- The rest of the duct → the body and tail of epididymis, vas deferens, seminal vesicles and the ejaculatory ducts.

*In female:
- The caudal most part → the ureteric bud, the trigone of urinary bladder.
- The rest of the duct → Gartner’s duct.

2-Carotid triangle:-

*Boundaries:
- Superiorly: posterior belly of digastrics.
- Anteriorly: superior belly of omohyoid.
- Posteriorly: anterior border of sternomastoid.
- Roof: skin, superficial fascia and investing layer of deep cervical fascia.

*Floor:
- Anteriorly: hyoglossus and thyrohyoid muscles.
- Posteriorly: middle and inferior constrictors of pharynx.

3-Tracts carrying touch sensation from face:

- Trigemino-thalamic tract: 1st order neuron: Trigeminal ganglion.
- 2nd order neuron: Main sensory nucleus.
- 3rd order neuron: VPMN of thalamus → sensory cortex.

- The trigeminal nerve supplies the skin of face through its 3 divisions: ophthalmic, maxillary and mandibular except area over the angle of mandible and capsule of parotid gland by great auricular nerve (C2 & 3).

4-Structures related to 1st part of duodenum:

*1st inch:*-Anteriorly: quadrate lobe of liver.
- Posteriorly: neck of pancreas.-Superiorly: lesser omentum.
- Inferiorly: greater omentum and head of pancreas.

*2nd inch:*-Anteriorly: quadrate lobe of liver and neck of gall bladder.
- Posteriorly: Bile duct to the right. Gastroduodenal artery to the left. Portal vein, IVC.
- Superiorly: opening into the lesser sac. Inferiorly: head of pancreas.

5-Blood supply of urinary bladder:

*Arterial:* -In male: superior and inferior vesical arteries.
- In female: superior vesical and vaginal arteries.

*Other arteries:* obturator, inferior gluteal and middle rectal.

*Venous:* Vesical venous plexus, continuous with prostatic plexus in male and vaginal plexus in female → Internal iliac veins.
Sensory Nervous System

1. Define synapse and describe its types (3 M) (June 2014) / Discuss the mechanism and properties of synaptic transmission. (May 2001)

2. List four properties of synaptic transmission and explain 2 of them. (May 2011) / Define convergence and divergence and mention the significance of each during signal transmission between synapses (Sept 2014)

3. Explain what is meant by postsynaptic inhibition, presynaptic inhibition, and lateral inhibition. Give example for each. (May 2006) & Define inhibitory post synaptic potential and explain its ionic bases (3 marks) (June 2013)

4. Mention the properties of the receptor potential. Describe the mechanism of adaptability receptors and differentiate between adaptation and fatigue. (May 2010)

5. Define "the generator (receptor) potential ". Describe its ionic bases and its characteristics. (May 2003) - (Properties: Sept 2013)

6. State the general principles of coding sensory information in the nervous system. (May 2006)

7. Classify the different sensations. Discuss briefly touch sensation. (September 1999)

8. Compare and contrast the fast and slow pain (June 2014) / and discuss the spinal and supraspinal pain control mechanisms. (May 1999-2001) (Sept 2004-2008-2012)

9. Describe the pain control mechanisms. (May 2000)

10. State and explain modulation of pain sensation (September 2006)

11. Describe the role of brain and spinal cord analgesic system in pain control. (Sept 2001) & Spinal gate control (June 2013) / Explain mechanism of stress analgesia. (Sept 2014)


13. Define referred pain and explain its mechanisms. (May 2012-Sept 2013)


15. Compare between somatic and visceral pain. (Sept 2004)

16. List the function of the cortical sensory areas. (May 2005)

17. Discuss the characters and functions of primary somatic sensory area (1). Describe the effects of its lesion. (May 2004)

18. Compare the sensory manifestations of thalamic lesion with a lesion affecting the sensory cortex. Discuss thalamic syndrome. (May 2007)

19. List and explain the effects of syringomyelia cavity involving the cervical and the thoracic segments of the spinal cord. (May 2005)

20. Define ataxia. What are the causes and characteristic features of its different types? (May 2008)
Motor Nervous System

1. Describe the properties of reflex arc. (Sep 2000)
2. Indicate the function of stretch reflex. Describe how it is measured. (May 1999)
3. Describe briefly the stretch reflex and its function. List the supra spinal centers affecting the stretch reflex. (May 2000-2014) (Sept 2012)
4. List the properties of stretch reflex. Mention the function of gamma (γ) efferent fibers. (May 2009)
5. Describe the static stretch reflex and explain its value in differentiating various neurological lesions. (May 2012)
7. Compare & contrast the flexor withdrawal reflex & crossed extensor reflex.
8. State the functions of gamma motor neurons and explain why they are stimulated at the same time as alpha motor neurons during voluntary muscle contractions. (Sep 2006)
9. Explain the significance of gamma motor neurons in the maintenance of muscle tone. (Sep 2005)
10. Examination of a patient shows the following on the right lower limb: weakness and flaccidity of calf muscles associated with the absence of knee jerk, ankle jerk and plantar reflex. What neurological structure may be affected to produce these findings. (Sep 2006)
11. Mention the areas responsible for planning of the motor act and explain the effect of lesion in the area 6 on the fine and gross movements (3m) (June 2013) & Compare and contrast functions and effects of lesions in area 4 and 6 (Sept 2008-2014) (May 2006-2011)
12. Discuss the physiological role of cortical motor function.
13. Describe the control of body movements. (May 2003) describe the role of cerebrocerebellum in controlling voluntary motor act (3 M) (June 2014)
14. Compare & contrast the function of pyramidal and non-pyramidal tracts.
15) Mention the different inputs on spinal lower motor neurons. Explain briefly how these inputs affect motor function. (May 2007)
15. Differentiate between upper and lower motor neuron lesions as regards the causes and extend of paralysis. (3 marks) (Sept 2013)
16. Discuss briefly the effect of complete transection of spinal cord at mid thoracic level. (May 2002)
17. Define spinal shock, and describe the initial and long-term changes in spinal reflexes that follow transection of the spinal cord. (May 2004)
18. Predict the immediate and delayed effects of a lesion to the posterior limb of internal capsule. (Sept 2005)
19. Describe the functions of the basal ganglia. Discuss briefly the effect of lesion in Substantia Nigra. (May 2002)
20. Explain the role of the basal ganglia in regulation of muscle tone and voluntary movements and the effect of its lesions on it (3 marks) (Sept 2012-
2014) (June 2013) + Outline the clinical features of the degenerative disease affecting basal ganglia. (May 2010)

21. Describe briefly the cases and manifestations of Parkinson’s disease. (Sept 99-2000)

22. List the physiological divisions of cerebellum and mention function of each. (May 2012) & role of cerebrocerebellum in regulating voluntary motor act. (Sept 2013)

23. Explain the role of cerebellum in coordination of voluntary movement. (May 2005)

24. Discuss the different functions of neocerebellum related to its connections. (Sep 2001- May 2000)

25. Define ataxia. What are the causes and characteristic features of its different types? (May 2008)

26. Differentiate between clinical spasticity and rigidity. (May 2007)

**Higher Brain Function**

1) Summarize functions of the semicircular canals, the utricle, and the saccule? (May 2008)

2) You cannot detect movement during traveling by a plane but you can detect the start and end of movement in a car. Can you explain why? (May 2007)

3) Explain the basic mechanism which maintain the upright posture. (May 2005)

4) Define sleep, mention its types and compare between them regarding recorded brain waves and threshold for arousal. (June 2014)/Describe the mechanisms of sleep. Compare and contrast between its types. (May 2003) (Sept 2008)

5) Mention the characteristics of rapid eye movement sleep and explain why it’s called paradoxical sleep. (May 2011)

6) Define memory. Describe its declarative type and explain how memory can be consolidated (Sept 2014)/ Compare between short term & long term memory. List the factors affecting consolidation of memory. (May 2009)

7) Compare and contrast between short and long term memory. (May 2012)

8) Define learning and mention types of simple and associative learning. Explain the underlying mechanism of each type. Outline the cause and the characters of Alzheimer’s disease. (May 2010)

9) List the areas of the brain believed to be involved in the production of speech and their function-describe the different types of aphasias produced by damage to these areas. (May 2008-Sept 2012)

10) Outline the process of normal speech and differentiate between aphasia and dysarthria. (Sept 2005)
11) Speech is due to coordinate refined movements. Explain the change in speech produced by the following lesions:  
   I –Lesion of neocerebellum .  
   II –Lesion of wernicke's area.  

(May 2006)

12) It is dangerous to swim or dive in water for patient with defective labyrinthine function. Can you explain why?  

(May 2007)

13) List the functions of Limbic system  

(Sept 2013)

**Special Senses**

1. Describe the formation and drainage of aqueous humor. What is glaucoma?  
   (Sept 2004)

2. Describe the function of aqueous humor (May 2012) & formation and drainage  
   (Sept 2013)

3. Outline the function of the iris and list four causes of miosis.  
   (May 2012)

4. What is the near response? Discuss the underlying mechanisms and mention its neural pathway & function.  

5. Explain how visual accommodation is achieved and mention the defects associated with myopia and hypermetropia and astigmatism.  
   (May 2005)

   (May 2008)

   (Sep 99, May 2002)  
   -Compare and contrast between rods and cones (4marks)  
   (Sept 2012-2014)

8. Explain briefly the changes in retinal sensitivity on exposure to dark & bright light.(May 2001, 2009) & electrical changes in the retina on light exposure (4m)  
   (June 2013)

9. What is meant by “Binocular vision, double vision and monocular vision?  
   (May 2006)

10. State the functions of the outer and middle ear?  
    (Sept 2005)

11. Describe the contents of middle ear and discuss the function of each. (May 99, Sep 2000)  
    & Describe the function of the middle ear muscles. (2marks) (Sept 2012)

12. Explain the role of middle ear in sound wave amplification (4 M) Explain the role of bony ossicles and basilar membrane in sound transmission. (May 2011)

13. Explain the role of bony ossicles in hearing.  
   (May 2012)

14. List the sequence of events that occur between entry of sound wave into the ear and the firing of action potentials in the cochlear nerve.  

15. List the steps involved in mechanisms of hearing. Discuss the cochlear microphonic potential.  
   (May 2009)

16. Discuss discrimination of sound by cochlea.  
   (Sept 2001)
17. Describe cochlear microscopic potential. Explain how pitch, intensity, and localization of sound are discriminated by the cerebral cortex. (May 2010)

18. Compare between function of primary auditory cortex and auditory association (June 2013) & mention the effect of their lesion on sound perception (Sept 2013)

19. Describe the four basic taste modalities and explain the mechanism of stimulation of the taste receptors in each one. (4 marks) (Sept 2012)

**Endocrine System**

1. Describe hypothalamic-pituitary relationship (May 2012) / hypothalamic pituitary connection and mention its significance (June 2014)

2. List the hormones released by the posterior pituitary? State the origin of these hormones and explain how the hypothalamus regulates their release (2005)

3. Compare the relationship between the hypothalamus and posterior pituitary with the relationship between the hypothalamus and anterior pituitary. Describe how anterior pituitary hormones’ secretion is regulated. (2002-2008)

4. List the different anterior pituitary hormones and explain how the hypothalamus controls the secretion of each. (May 2011)


6. What are the typical signs and symptoms of acromegaly? (2007)

7. Describe the effects of prolactin during pregnancy and after labour (its function) and mention the effects of hyperprolactinemia. (4 marks) (Sept 2012-June 2013)

8. Describe regulation of ADH secretion. Mention the effects of its deficiency. (May 2011)


10. Explain the role of thyroid hormone in growth. (May 2012)


13. Outline the immediate and delayed actions of PTH on bone. (May 2012)


15. What is tetany? What are its causes? What are the physiological basis in the treatment of the tetanic state. (May 2005)


17. Describe briefly the function and mechanisms of aldosterone hormone secretion. Explain how the secretion of this hormone is regulated. (2002)(May 2011)


20. Describe the function of insulin hormone. And explain its mechanism of action. (2001)


22. Discuss briefly hormonal regulation of blood glucose level. (1999) (Sept 2014)

23. List the hormones needed for normal growth. What are the endocrinologic causes of dwarfism? and how does each lead to short stature? (2004) Both growth hormone and thyroid hormones are needed for growth. Mention their actions on growth and the effect of deficiency of each before puberty (Sept 2014)

24. List the hormones essential for life. Describe the mechanism of action and regulation of secretion of each hormone. (2010)

**Reproductive System**

**Male Reproductive System:**

1. Discuss factors controlling spermatogenesis (May 1999) (Sept 2014)

2. Explain the hormonal control of spermatogenesis. Mention the effect of undescended testes on testicular function (September 2004) & indicate the cause of sterility in cryptorchidism (June 2013) & state the effects of androgens on the male accessory sex organs (September 2006) & function of testosterone (Sept 2013)

3. Discuss the functions of Sertoli cells. (May 2005-2009-2014) (Sept 2012) describe the control of testicular function (Sept 2001) Explain feedback control of testicular function (May 2012)

4. Describe the reproductive and non-reproductive functions of testosterone hormone in adult male (May 2011)

**Female Reproductive System:**

1. Discuss briefly the female reproductive cycles. (May 2003)

2. Compare the phases of menstrual cycle according to uterine and ovarian events (May 2004)

3. Mention the 3 phases of uterine cycle. Explain the underlying hormonal mechanisms for each phase (May 2010), (May 2012)

4. Compare physiological function of Estrogen & progesterone (Sept 1999-2005) explain how estrogen and progesterone have both synergistic and antagonistic effect on uterus (June 2014)
5. Mention the sources of estrogen. Outline its main functions.  (Sept 2008)
6. Illustrate with diagram how the LH surge is controlled and mention its effects.  
   (May 2011)
7. List the hormones secreted by the placenta. What is meant by fetoplacentalunit 
   (May 2008) & Function of placenta  (Sept 2013-2014)
8. State the actions of human chorionic gonadotropin and mention its clinical 
   significance  (4 marks) (June 2013)
9. What is menopause? State its causes? List the hormonal and anatomical changes 
   that occur after menopause? Do men get a similar state?  
   (May 2007-Sept 2012)

   **Renal System**

1. What are the distinguishing characteristics of a superficial nephron? (May 2007)
   & Describe component of Juxtaglomerular apparatus, and mention its 
   importance  (Sept 2012) (June 2014)
2. State and explain the most unique feature of renal circulation.  (May 2006)
3. Discuss the regulation of renal blood flow. Describe how it's measured.  
   (May 1999)
4. Explain the intrinsic and extrinsic mechanisms that regulate renal blood flow.  
   (May 2010)
5. What is meant by "renal autoregulation"? Explain the mechanisms that lead to 
   autoregulation of renal blood flow and glomerular filtration rate.  (May 2005)
6. What are the preglomerular blood vessels? Which blood vessels in the kidney 
   provide for the greatest resistance to blood flow? How would selective changes 
   in preglomerular or postglomerular renal vascular resistance alter GFR?  
   (May 2008)
7. Explain forces determining glomerular filtration. Describe factors affecting 
   GFR (September 1999) (September 2000) +Define glomerular filtration  
   (May 2009)
8. What is the GFR in normal human? How can GFR be measured? Can GFR be 
9. Explain regulation of glomerular filtration  (September 2008)
10. What are the pressures favoring and opposing glomerular filtration? How can 
    GFR be measured?  (May 2007)
11. Discuss the forces involved in glomerular filtration. Explain why glomerular 
    filtration rate is normally high and list four conditions in which glomerular 
    filtration rate decreases  (May 2002)
12. State the composition of the glomerular filtrate and explain how it is produced 
    (September 2006)
13. Discuss the renal plasma clearance concept (May 2003) & mention its equation 
    and explain how it is used to measure blood flow.  (4 marks) (Sept 2012)
14. Define the term "renal plasma clearance" and explain why clearance of inulin is equal to glomerular filtration rate. (May 2006) & explain why the clearance of inulin is used for measuring the glomerular filtration rate (May 2010)
15. Explain how fluids and solutes reabsorbed by the renal tubules are taken up into plasma (September 2005)
16. What are the pressures favoring and opposing renal tubular reabsorption. How can reabsorption by the proximal tubule be modulated? (May 2007)
17. Compare Na reabsorption in the proximal and distal convoluted tubules of the kidney (May 2011)
18. What is the distal nephron? compare and contrast the functions of the proximal renal tubule and the distal nephron (May 2005)
19. Very Important: How does Na affect reabsorption of other elements in PCT?
20. State the transport and permeability characteristics of the descending and ascending loop of Henle and the vasa recta (May 2005)
21. Explain how the countercurrent exchange occurs in the vasa recta and state the functional significance of this mechanism (September 2006)
22. Explain how the countercurrent multiplier system works and discuss its functional significance (May 2008) & its role in urine concentration (Sept 2013)
23. Describe the factors affecting the ability of the kidney to concentrate urine (May 2000) & ADH role (June 2013)
24. Describe the mechanisms by which the kidney produces concentrated urine. (September 2008)
25. Explain the role of loop of henle and vasa recta in urine concentration. (May 2012)
26. Define diuresis and difference between water, osmotic and pressure diuresis. (3marks)(Sept 2006-2012-2014)
27. Describe the details of the tests used in man for assessment of glomerular function (May 2004)
28. Discuss briefly the methods used for testing the renal functions (May 2001)
29. Explain the main body defense systems against the change in hydrogen concentration regarding rapidity of action and efficiency (Sept 2001) & renal tubular buffering mechanisms of H ions secretion (June 2013)
30. Outline the different mechanisms regulating blood PH. Mention the factors affecting H secretion. (May 2012)
31. Describe the role of the kidneys in the regulation of acid-base balance (Sept 2004)
32. Suppose a person with diabetes mellitus had an arterial pH of 7.3, an abnormally low arterial Pco2, and an abnormally low bicarbonate concentration. What type of acid-base disturbance would be this? What might have caused it?
33. Define anion gap, what is its normal value and the significance of its calculation (Sept 2014)

34. Compare and contrast uncompensated and compensated respiratory acidosis. (Sept 2008)/ Describe body correction of uremic acidosis (June 2014)

35. Explain the mechanism of micturation. (May 2010-Sept 2013)/ Discuss voluntary control of micturition (Sept 2014)

36. What are the immediate and the delayed effects of complete transection of the spinal cord in the thoracic region on micturation? (May 2005)

**Digestive System**

1. What are the major physiological functions of salivary secretion? How is salivary secretion regulated physiologically? (Sep 2005) (May 2007) Compare and contrast between simple and acquired reflexes controlling salivary secretion (5m) (June 2013)

2. Describe the mechanism of deglutition. List the phases of swallowing reflex. (Sept 2014)

3. Discuss pharyngeal esophageal stage of swallowing. (May 2012)

4. Outline the phases of gastric secretion. Explain the first two phases (Sept 2000) (May 2008)

5. Describe the mechanisms concerned with the release of gastric hormones. What are their functions? (May 2002)


7. Discuss the mechanism of gastric secretion. (May 2002)

8. Enumerate the gastrointestinal hormones and describe the release and function of one of them. (May 2000) (Sep 2003) (May 2005)

9. Discuss the mechanisms of secretion and formation of gastric HCl. Mention the different stimuli that affect it.

10. State the mechanisms concerned with the release of gastrin hormone. What are the major actions of this hormone? (May 2006)

11. Explain the effect of fatty meal on the gastric and intestinal secretions (Sept 2004) (May 2005) (Sept 2013)


14. Write short notes on:
   1 - Gastro-colic reflexes.  
   2 - Cholagogues.

15. Discuss the types and mechanisms of small intestinal secretions.


18. Describe the regulation of hepatic bile secretion (May 2012) & Describe enterohepatic circulation of bile salts and its importance. (5marks) (Sept 2012)

19. Trace the pathway of formation, conjugation, and excretion of bilirubin and explain how jaundice may be produced. (Sep2009)

20. Describe the functions of cholecystokinin in. (Sept 2013)/ Compare between secretin and cholecystokinin in regarding their actions on the pancreas and biliary system (Sept 2014)

**Metabolism**

1. Discuss the thermoregulatory mechanism on exposure to hot weather. Summarize the sequence of events leading to fever. (May 2002-2004-2014) (Sept 2001-2005-2006-2008)


3. Define and locate thermoregulatory centers. Explain briefly thermoregulatory mechanisms to cold exposure. (May 2011-Sept 2012)

4. Discuss the role of hypothalamus in temperature regulation. (May 2008)

5. Write short notes on the appestat centre & discuss the factors regulating its activity (May 2003) (2009 May)

6. Define the specific dynamic action and explain its causes. (May 2012)


8. Discuss BMR & what its value in normal adult? Describe bases of calculating caloric requirement of a person. (May 1999)


10. Discuss the change in metabolism of organic substances during severe starvation.

11. Mention the thermogenic hormones and explain the mechanism of fever (4 marks) (June 2013)

**June 2013**

**Answer the following questions : (65 marks)**

1. a) Define inhibitory post synaptic potential and explain its ionic bases (3 marks)

   b) Describe spinal gate controlling pain transmission (3 marks)

2. a) Mention the areas responsible for planning of the motor act and explain the effect of lesion in the area 6 on the fine and gross movements (3 marks)

   b) Explain the effect of basal ganglia on muscle tone and the effect of its lesions on it (3 marks)

   c) List sensory centers of speech and the function of each (3 marks)
3.  a) Explain the electrical changes in the retina on light exposure  (4 marks)
b) Compare between function of primary auditory cortex and auditory
   association area (4 marks)
4.  a) Explain the role of Antidiuretic hormone (ADH) in urine concentration (5 marks)
b) Describe renal tubular buffering mechanisms of hydrogen ions secretion (5 marks)
5.  a) Describe the functions of prolactin and indicate the effect of hyperprolactin-
   aemia in female and in male (5 marks)
b) Describe factors controlling cortisol secretion (5 marks)
6.  a) State the actions of human chorionic gonadotropin and mention its clinical
   significance (4 marks)
b) Mention the hormonal factors affecting spermatogenesis. Indicate the cause
   of sterility in cryptorchidism (4 marks)
7.  a) Compare and contrast between simple and acquired reflexes controlling
   salivary secretion (5 marks)
b) Describe regulation of hydrogen acid secretion by the gastric parietal cells (5 marks)
8.  Mention the thermogenic hormones and explain the mechanism of fever (4 marks)

   Sept 2013

1.  a. Describe properties of receptor potential. (3 marks)
b. Define referred pain and explain its mechanisms. (3 marks)
2.  a. Differentiate between upper and lower motor neuron lesions as regards the
   causes and extent of paralysis. (3 marks)
b. Describe the role of cerebrocerebellum in regulating voluntary motor act. (3 marks)
3.  a. Enumerate functions of the limbic system. (3 marks)
b. Describe the formation, drainage and functions of aqueous humor. (3 marks)
c. Compare the functions of primary auditory cortex and auditory association
   area and mention the effect of their lesion on sound perception. (3 marks)
4.  a. Describe the mechanisms regulating growth hormone secretion and mention
   the effects of its hypersecretion after puberty. (5 marks)
b. List the target organs for parathyroid hormone. Describe its effect on each
   one and explain the effect of its deficient secretion. (5 marks)
c. Describe the physiological functions of cortisol hormone and state the
   drawbacks of its prolonged use in therapy. (5 marks)
5.  a. Describe the functions of testosterone at puberty. (3 marks)
b. Describe the functions of the placenta. (3 marks)
6. a. Explain the role of the counter current multiplier system in urine concentration. (5 marks)
   b. Discuss the mechanism of micturition. (5 marks)
7. a. Define vomiting and describe briefly its mechanism. (5 marks)
    b. Describe the functions of cholecystokinin. (5 marks)
8. Define basal metabolic rate and state the effect of pregnancy and hot climate on it. (3 marks)

**June 2014**

**Answer the following Questions:** (65 marks)

1. a) Define synaps and describe its types (3 M)
    b) Differentiate between fast pain and slow pain (3 M)
2. a) Describe supraspinal control of stretch reflex (3 M)
    b) Describe the role of cerebrocerebellum in controlling voluntary motor act (3 M)
    c) Define sleep, mention its types and compare between them regarding recorded brain waves and threshold for arousal (3 M)
3. a) Explain the role of middle ear in sound wave amplification (4 M)
    b) Compare between photopic and scotopic vision (4 M)
4. a) Describe component of Juxtaglomerular apparatus, and mention its importance (5 M)
    b) Compare between the three main body defense systems against the change in hydrogen concentration regarding rapidity of action and efficiency. Describe body correction of uremic acidosis (5 M)
5. a) Discuss hypothalamic pituitary connection and mention its significance (5 M)
    b) Describe the function and control of secretion of aldosterone hormone (5 M)
6. a) Discuss the function of Sertoli cells (4 M)
    b) Explain how estrogen and progesterone have both synergistic and antagonistic effect on uterus (4 M)
7. a) Mention function of gall bladder (5 M)
    b) Describe regulation of pancreatic secretion (5 M)
8. Describe thermoregulatory mechanism on exposure to hot weather (4 M)

**Sept 2014**

**Answer all the following questions:**

1. a) Define convergence and divergence and mention the significance of each during signal transmission between synapses (3 marks)
    b) Explain mechanism of stressanalgesia. (3 marks)
2. a) Describe function of motor area 4. (3 marks)
    b) Describe the role of basal ganglia in controlling muscle tone. (3 marks)
    c) Define memory. Describe its declarative type and explain how memory can be consolidated. (3 marks)
3. a) Compare between rods and cones of retina. (4 marks)
b) Describe how sound waves are transmitted from air to the basilar membrane of the inner ear. (4 marks)

4. a) Define diuresis and compare between water and osmotic diuresis. (5 marks)
b) Define anion gap, what is its normal value and the significance of its calculation. (3 marks)
c) Discuss voluntary control of micturition. (2 marks)

5. a) Both growth hormone and thyroid hormones are needed for growth. Mention their actions on growth and the effect of deficiency of each before puberty. (5 marks)
b) Discuss hormonal regulation of blood glucose level. (5 marks)

6. a) Discuss the factors that influence spermatogenesis. (4 marks)
b) Describe the function of placenta. (4 marks)

7. a) List the phases of swallowing reflex. (5 marks)
b) Compare between secretin and cholecystokinin regarding their actions on the pancreas and biliary system. (5 marks)

8. Define basal metabolic rate (BMR), mention its value. Enumerate three diseases accompanied by increased (BMR). (4 marks)

Answers

Sensory

1-Mech.>>p.8 & properties: forward conduction, synaptic delay, fatigue, potentiation, effect of hypoxia & acidosis & alkalosis
2-ans. Of 1
3-p.9,10
4-properties>>p.31, adaptability >>p.33, comparison >>p.34
5-p.30,31
6-p.35
7-p.38 (somatic, visceral, organic, special & emotional)
Touch sens. >>p.41 (fine & crude + def.)
8-comparison >>p.57 & control >>p.63,64
9-pain control >>p.63
10-p.63
11-p.66 + theories >>p.62
12-ans. of 12
13-p.58,59,60
14-p.60 + def., causes, receptors
15-sl>>p.71,slII>>p.72,association>>p.72
17-p.71
18-thalamus p.77 & p.71,72
19-p.76
20-ataxia: incoordination of voluntary movements in absence of ms paralysis
Types: -sensory: lesion (D.C), +ve Romberg
-motor: neocerebellum, -ve Romberg

### Motor

1-p.83  2-p.87-88  3-p.80-87-88-93  4-p.83
5-p.84  6-p.95  7-p.95-96  8-p.92
9-p.92  10-p.105(area 6)  11-p.104-105
12-p.104-105(areas 4-6&supplementary)  13-p.99-100-101
14-pyramidal(p.111)..non(p.115)
15-p.91:-nerve endings …-interneurons ….projection from higher centers
16-above T12>>quadriplegia ….below>>paraplegia
17-p.120
18-Contralateral hemiplegia ,may be associated by sensory visual &auditory signs

### Higher Brain Function

1-p.166:-angular acceleration
p.163 :-orientation of z head in space-linear acceleration
2-during>>equal discharge, Start&end>>utricule &saccule
3-hair cells of both sides exposed 2 equal stretch >>equal discharge from both
macula reaching nervous system &rate of discharge in gamma efferent (p.160)
4-p.187 :-passive&active theories / p.191:-REM&non-REM
5-p.189:-rapid eye move/dreams/decrease ms tone/increase impulse
……&paradoxical>>increase brain activity
6-p.193&194  7-as 68-p.195&196 ……mech.(ca+2/k+) ……
Alzheimer >>-loss Ach…..-loss short-term memory …..-loss of synapse ….neurodegenerative disease
9-broca’s &Exner’s …..-sensory,motor&global(p.206/207)
10-mech.(p.205)……aphasia:no speech >> lesions of speech
centers…….dysarthria:on speech >>defect of articulation (p.205-207)
11-I>>stactto speech …II>>general aphasia
12-yes.disorder to maintain body position&rotation

### Special Senses

1-p.227,228&p.230  2-3-p.228  3-p.248 ,,p.249,250
4-p.235  5-p.236  6-p.248
7-p.265  8-ans. Of 7 =>(sr pc) ya3ny <<spotic>>(r)ods & (p)hotopic
>>ones
9-p.276 ,, +monocular vision : maximum areas of space that can be seen by fixed
eyes
15-transmission ,stimulation ,transmission,stimulation p.293,294,295>>>299
16-frequency &intensity &locality  17-p.298

### Endocrine

1-P.22  2-P.23  3-P.23 ,, P.29  4-P.28,29
5-p.35 (na5od balna eno ely by affect 3leh mo4 el effect beta3o)…. Acromegaly
(p37)
6-p.37  7-p24,25  8- h2ol 3la cell &body …p.45,46,47
9-p.4710-p.56,57 11-p.56,57,58  12-p.56
Reproductive System

Male:
1-P.103  2-P.104……p.106(cryptorchidism)
3-P.104….Effects:formation/growth/maturation&Maintenance of body changes in puberty
4-p.97……  5-p.97…..p.103  6-p.97  7-p.101  8-p.99-100

Female:
1-htklem 3n ovarian cycle@ uterine cycle w kol wa7da feha kam phase w h2ol 7aga baseta 3n elly by7sal feha
6-p.114-1157-zy 58-zy 5

Renal
1-p.135  2-p.133-134  3-p.151-152…p.149
4-p.149-152-yes(decrease of –ve charges)  5-153-154  6-p.151-152…..
7-zy 6  8-p.155-156  9-zy 8  10-p.140-141
11-zy 10  12-p.141-154  13-p.149  14-p.139-153
31-respiratory alkalosis …p.217
32-compensated >> kidney increase H+ excretion …p.217
33-2 stages :filling&reflex …p.224….
34-p.224…p.226(automatic bladder)

Digestive System
1-function of saliva :-digestion –antibacterial action –solvant(buds) –neutralized acids –speech –swallowing
Control: conditioned &unconditioned …p.250
2-initiated voluntarily then it cannot be stopped ,3 stages :oral , pharyngeal & esophageal (vol. , duration &mechanism )
3-pharyngeal esophageal stage (2 stages)
4-cephalic ,gastric &intestinal (neural/hormonal/accounts/el rasma )
5-pepsin, gastrin , & intrinsic factor (Ach , histamine & somatostatin )
6-7>>>> ans. Of 4
8-gastrointestinal hormones :3 gastric &enterokinase(trypsiongen)-disaccharidases (3)-peptidases(amino&intracellular )
9-parietal cell &H+>>1ry active transport(k+) &cl->>>2ry active transport (Hco3-)
*Ach &gastrin >>>>>>>+++- *PGE2& somatostatin >>>>>>----
10-parietal /Ecl/chief cells
11-inhibition of gastric secretion (inhibitory to intestinal phase …p.273)/secretion of pancreatic lipase
12-causes : inside &outside …..mech.: -deep inspiration – closure of glottis –
evaporation of soft palate – downward contraction of diaphragm – contraction of all abdominal ms – squeezing of stomach – duodenum contracts strongly
13-control: hormonal (secrtin & cholecystokinin) -neural (cephalic & gastric/vagal) -
proteolytic enz. : digest protein-pancreatic amylase : digest cho- lipase: fat
14-arrival of new food to stomach mediated by gastrin & parasymp. mass movements of ascending & transverse colon >>>>pushing colonic contents into rectum >>> trigger defecation reflex
-cholagogues : subs. Cause contraction & emptying of gallbladder : cck
15-types : -aqueous salts (H2o & Hco3)-mucus >> protection & lubrication
-mech.: Local stimuli >> chyme >> stimulate receptors
Hormonal >> chyme >> release secrtin & cck
16-Empty by : hormonal : cck & neural : vagus into duodenum
17-fat digestion >>> detergent action: absorption >> formation of micelles
18-chemical /hormonal/ neural mechanisms (3)
19-p.291 & jaundice >> bilirubin > 2mg/dl plasma

**Metabolism**

1-p.346 & 348 2-zy 1 3-p.346 & 348 4-p.345 5-p.353 (hypothalamic center)

**June 2013**

1- a) page 10 in volume 4 book  b) page 63 in volume 4 book
2- a) premotor cortex, supplementary motor areas, basal ganglia and cerebellum the effect is paresis and motor apraxia
b) page 134 in volume 4 book
effect of lesion: rigidity and hypertonia (page 138) but in caudate nucleus lesion the effect is hypotonia (Chorea)
c) page 203
3- a) page 261 in volume 4 book  b) page 297 in volume 4 book
4- a) page 181 in volume 3 from the paragraph which begin with (2-ADH which …)
b) page 213 (the title Buffering of H secreted by tubules)
5- a) page 40 and 41 in volume 3 book  b) page 73
6- a) page 123 and 124 in volume 3 book  b) page 104. Cryptorchidism in page 106
7- a) page 250 in volume 3 book  b) page 270
8- page 349
Biochemistry
**Signal transduction & hormones**

**Give short notes on:**
2. Protein and its role in cAMP dependant protein kinase. (May 2002)
3. cGMP as a 2nd messenger, its synthesis and function. (May 2005)
4. Phosphoinositides cascade. (Sept 2006)

**Explain:**
1. Role of G protein in hormonal action and mention 2 hormones that act by this mechanism. (May 1998)
5. The insulin receptor: structure and mechanism of action. (May 2006)
6. Mechanism of intracellular calcium release & its role as a 2nd messenger. (Sept 2007)
7. Synthesis, mode of action and inactivation of AMP. (Sept 2008)

**Discuss:**
1. Types and features of hormone receptors. (May 2000)
2. Types and regulation of hormone receptors. (May 2006)

**Enumerate**
1. 4 different second messengers. Explain mechanism of formation of one of them. (May 2003)

**Compare between**
The mechanisms of action of peptide & steroid hormones. (May 2009)

**Carbohydrate Metabolism**

**Glycolysis:**
1. Glycolysis occurs through an amplification cascade. Explain. (May 2005)
2. Mention the steps by which glucose is converted to lactose & What are the regulatory enzymes? Explain how these enzymes are regulated. (Sept 2001)
3. Explain how glceraldehyde 3-phosphate is formed from glucose by two different pathways mention the regulation and enzymes defect of these two pathways. (May 1997)
4. Explain metabolic fate of Pyruvate in starved state. Regulation is required. (19 marks) (May 2008)

5. Explain each of the following:
   a) Synthesis and regulatory role of bifunctional enzyme phosphofructokinase 2 / fructose 2,6 bisphosphate . (Sept 2004)(May 2011)
   b) Important of pyruvate kinase and glucose 6-phosphate dehydrogenase enzymes in Red cell metabolism. (May 1998)
   c) Regulation & function of glycolysis in RBCs and adipose tissue. (May 2000)

6. Give the biochemical explanation of each of the following:
   Deficiency of pyruvate Kinase and glucose-6-phosphatedehydrogenase in RBCs results in hemolytic anemia. (Sept. 2004)

7. For each of the following enzymes, illustrate the reaction, its regulation, importance and consequence of defect in the enzyme:
   a- pyruvate dehydrogenase complex (May 2006)

**TCA Cycle and Glycogen Metabolism:**

1. Explain -synthesis of citrate and its regulatory effect on TCA cycle and lipogenesis (May 2004)

2. - Explain the amphibolic nature of TCA cycle (Sept.2000)(May 2004)
   - Control of citric acid cycle and the interactions between the cycle and the othersmetabolic pathways. (May 1998)

3. Give an account on:
   1- synthesis and fate of each of the following in different metabolic pathway:
      a- UDP Glucose . (10) (Sept 2006 – May 2011)
      b- Citrate (9). ( Sept 2006)

4. Show the differences between liver and muscle glycogenolysis as regards functions and regulation. (15) (May 2005)

5. Explain synthesis of UDP glucose. Discuss how its converted to glycogen and glucuronic acid. Mention the importance of each pathway. (Sept 2004)

6. Give two reactions (substrates, products and cofactors) for each of the following: (6 Marks each) Anabolic role of uridine diphosphate glucose (Sept 2008)

7. Mention biochemical explanation of the followings: (21)
   High ATP/ADP ratio and product accumulation inhibit TCA cycle. (May 2008)

**Gluconeogensis and HMP Pathway:**


2. During starved state alanine is converted to glucose. Explain its sites, steps & regulation of such metabolic biotransformation (May 2001)
3. Illustrate diagrammatically synthesis of glucose from glutamate and its regulation. What are the conditions associated with active gluconeogenesis? (14 Marks) (Sept. 2003)

4. Give an account on: Significance of hexose monophosphate pathway. (8 Marks)

The Rest of the chapter and Diseases:
1. Give short account on hormonal regulation of: blood glucose (Sept. 2001)
2. Illustrate diagrammatically the following metabolic interconversions and mention enzyme and cofactors (10 marks): Glucose to sorbitol (2.5) (May 2008)
3. Types of glucosuria. (May 1997)
4. Give the biochemical explanation for each of the following: Glucosuria is not always an indication of diabetes (15 Marks) (Sept. 2005)
5. Explain 2 examples of inborn errors in carbohydrate metabolism. (Sept. 2000)
6. Give the biochemical explanations of each of the followings: Development of cataract in uncontrolled diabetes mellitus (16 marks) (May 2004)
7. Mention 3 errors in carbohydrate metabolism manifested by hypoglycemia giving enzymatic defect in each “6 marks”
8. Mention the deficient enzyme in each of the followings: “7 marks” hemolytic anemia- severe galactosemia (2007 May)
9. Hypoglycemia may be due to an inborn error in carbohydrate metabolism or impaired fatty acid oxidation. (6M) (Sept. 2007)
10. - On biochemical bases, Explain: (4 Marks each)
   - Carnitine deficiency results in hypoglycemia.
   - G-6-phosphatase deficiency may cause secondary gout 6-P dehydrogenase deficiency results in hemolytic anemia (Sept 2008)
11. Explain the metabolic role of each of the following during starvations: Cori cycle - Glucose-Alanine cycle. (May 2005)
12. Discuss the following: malate shuttles (Sept 1998) (Sept 2008)
13. A diabetic patient was admitted to the hospital with high blood glucose and glucosuria
   a) Describe the normal hormonal control of blood glucose. (3 marks)
   b) How would you estimate the average blood glucose in this patient in the last two months? (1 mark)
   c) list the causes of glucosuria. (3 marks) (2012)
14. Mention the name of the defective enzyme in the following:
   i. Von Gierke's disease.
   ii. Essential pentosuria.
   iii. Galatosaemia.
   iv. Fructose intolerance.
   v. Favism (May 2002)
15. A baby was brought to a specialized medical center in a bad condition. The child was properly investigated and found to have deficiency of the enzyme uridyl transferase needed for galactose metabolism: (Sept 2013)
(a) Illustrate the chemical reaction catalyzed by this enzyme. (2 marks)
(b) Describe the consequences of this deficiency. (1 mark)
(c) How should this baby be managed? (1 mark)
(d) How can this patient form the galactosides needed by the body? (1 mark)

16. Following an attack of enteritis, a 20 year old student suffered cramps and diarrhea upon milk ingestion:
(a) What is the possible cause of this patient’s condition? (1 mark)
(b) Illustrate the chemical reaction defective in this patient. (1 mark)
(c) Describe other related chemical reactions that may also be defective in this patient. (1 mark)
(d) Describe how glucose is absorbed from the intestinal lumen. (2 marks) (Sept 2013)

17. A urine sample had a reducing sugar as tested by copper sulfate-based reagent but was negative for glucose oxidase-based urine dipsticks.
(a) If the patient was a breast-fed infant and after full investigation the parents were warned against any milk feeding of this infant. Name the most probable enzyme deficient in this case and illustrate the chemical reaction it normally catalyzes. (2 marks)
(b) List three other possible reducing sugars in this urine sample and indicate the condition leading to each one. (3 marks)
(c) From your study of carbohydrate metabolism, name another condition in which patients avoid milk intake and illustrate the deficient reaction. (2 marks)
(d) With no milk intake, illustrate the biochemical reaction by which the patient gets active galactose for synthetic purposes. (1 mark)
(e) Illustrate another reaction, not involved in carbohydrate metabolism, that when deficient leads to milk restriction. (2 marks) (June 2014)

18. A ten year old boy had repeated attacks of hemolysis that followed eating beans. His condition was diagnosed as a hereditary enzyme deficiency.
(a) What is the deficient enzyme? (1 mark)
(b) Illustrate the reaction catalyzed by this enzyme. (1 mark)
(c) Explain why hemolysis takes place in this patient. (3 marks) (Sept 2014)

Collective Questions around the chapter:
1. Enumerate different fates of glucose 6- phosphate. Illustrate diagrammatically onepathway. Explain its regulation, importance, and one inborn error. (14 marks) (May 2003)
2. Allosteric regulation play an important role in carbohydrate metabolism. Explain this statement as regards TCA cycle and gluconeogenesis “10 m”
3. Illustrate the oxidative steps in glycolysis, HMP pathway and glucuronic acid pathway, explain their importance.

4. Mention regulation of glycolysis and HMP pathway “13 marks” (May 2007)
   A) Synthesis of Sorbitol from glucose.
   B) One reaction of ATP formation by substrate level phosphorylation.
   C) A citric acid cycle reaction inhibited by high NADH/NAD ratio.
   D) A glycolytic reaction inhibited by fluoride. (Sept. 2007)

5. Mention the names of key regulatory enzymes for glycolysis, Krebs cycle and gluconeogenesis. Explain how these enzymes are regulated. (May 2002)

6. Glycerol can be metabolized to pyruvate or converted to glucose. Explain illustrating your answer diagrammatically. Regulation is required when present (Sept 2005-2007)

7. ATP generation by substrate level phosphorylation (6 Marks) (2005 sept)

8. Compare:
   a- Glycolysis and HMP pathways as regards: phases, end products of each phase, metabolic importance and regulation. (20 marks) (May 2004)

9. Mention the consequence & name of disease resulting from the deficiency of each of the following enzymes:
   a) Glucose 6-phosphatase. (2 marks) (May 2009 – 2012)
   b) Glucose 6-phosphate dehydrogenase (May 2009 - 2012)
   c) Hexokinase. (2 marks) (May 2012)
   d) Aldolase (May 2012)

10. Give short notes on the sources and fate of oxaloacetate. Enzymes and coenzymes in different reactions are required. (May 2003) (May 1996)

11. Discuss the following; Formation and fate of succinylCoA (6 marks) (Sept 1998) (Sept 2004) (Sept 2008) (Sept 2012)

12. A ten years old boy had repeated attacks of hemolysis that followed eating beans his condition was diagnosed as a hereditary enzyme deficiency
   a-What is the deficient enzyme
   b-Illustrate the reaction catalyzed by this enzyme
   c-Explain why hemolysis takes place in this patient (May 2011)

13. A 3-year-old male child developed fever, rapid pulse and weakness after eating fava beans. After 4 days, his skin and eyes were yellow and his urine was brownish. Blood analysis revealed low hemoglobin and high total bilirubin.
   a) Name the enzyme defective in this child (1 mark)
   b) Write the reaction catalyzed by this enzyme (2 marks)
   c) Explain the biochemical basis for low hemoglobin in this child (4 marks)
   d) Why is the urine brownish in this patient? (1 mark) (June 2013)
   e) Describe the oxidation-reduction cycle of glutathione in red blood cells. (4m)(June 2014)
14. A diabetic patient was admitted to the hospital with high blood glucose and glucosuria.
   a) List the hormones that increase blood glucose. (2 marks)
   b) How would you estimate the average blood glucose in this patient in the last two months? (1 mark)
   c) List the causes of glucosuria. (2 marks)

**Bio Enrgetics**

Give a short notes on:

2. Role of carnitine and the effect of its deficiency. (May 2003)
3. The effect of uncouplers on oxidative phosphorylation. Two examples are required. (May 2003, Sept 2004)
4. ATP generation by substrate level phosphorylation. (Sept 2005)

**Explain:**

1) Explain metabolic importance of NADH+H. (Sept 2000)
2) Differences between inhibitors and uncouplers of oxidative phosphorylation giving ONE example for each. (May 2006)
3) Role of shuttle system in transport of reduced equivalents to mitochondria. (Sept 2006)
4) Chemosmotic theory of ATP formation. (Sept 2006)
5) Carnitine deficiency results in hypoglycemia (Sept 2008)

-A patient was diagnosed as having mitochondrial myopathy with lactic acidosis and inability to do aerobic exercise:
   a. Explain why lactic acidosis develops in this patient. (2 marks)
   b. Illustrate the mitochondrial electron transport chain reaction that involves oxygen. (1 mark)
   c. Describe the mechanism of ATP production by the mitochondria. (1 mark)
   d. Describe the action of thermogenin on this mechanism. (1 mark) (Sept 2013)

**Lipid Metabolism**

**FA synthesis and oxidation:**

2. Explain synthesis of citrate and its regulatory effect on TCA cycle and lipogenesis. (May 2004)
3. Give biochemical explanation for each of the following: Insulin stimulates lipogenesis in well fed state. (May 2005)
4. Glycerol is a substrate for lipogenesis. Explain. (Regulation is required when present) (Sept 2007)
5. On biochemical bases, Explain: 
   a- Elevated cytoplasmic citrate is a green signal for lipogenesis. (Sept 2008)
7. Illustrate diagrammatically the following metabolic interconversions and mention enzyme and Cofactors : 
   - Acetyl CoA to Malonyl CoA (May 2008)
8. Give short account on:Role of carnitine and the effect of its deficiency (May 2003)
10. Discuss the biological compounds derived from Transportation of palmitic acid into mitochondria. (May 2009)
11. Discuss the steps of oxidation of palmitic acid & calculate the number of ATP molecules generated (May 1996)
12. Explain each Regulation of fatty acid oxidation . What is the energy released from oxidation of stearic acid? (Sept 2003)
13. Write the reactions catalyzed by the following enzymes and mention their importance. 
   a) AcetylCoA carboxylase.  b)Carnitine palmity transferase. (May 1998)
15. Explain Hypoglycemia may be due to an inborn error in carbohydrate metabolism or impaired fatty acid oxidation. (Sept 2007)
16. You are given a five-carbon, straight chain, saturated fatty acid (5:0): 
   a. Diagrammatically, show the pathway of its oxidation. Write the names of the enzymes and coenzyme involved. 
   b. What are the final products of this pathway, and how do they enter the citric acid cycle. (May 2010)
17. Discuss adipose tissue lipolysis (May 2000)
18. Describe how acetyl CoA is shuttled outside the mitochondria. (3 marks)(2012)

**Ketogenesis :**
19. Write the role of succinyl co A in ketone body utilization (May 1996)
21. Write the reactions catalyzed by the following enzymes and mention their importance. 
   -Acyl CoA synthetase (Thiokinase)  
   -Thiophorase(succinyl coA acetoacetate transferase) (May 1998)
22. Explain :Formation and Fate of acetoacetate  
   (Sept 2000)
23. Illustrate diagrammatically the following biotransformation . Mention enzymes and co-factors for each:acetoacetate to acetyl Co A.  
   (May 2003)
24. Explain the metabolic role of Ketone bodies during starvation  
   (May 2005)(September 2006)
25. Explain Formation and utilization of succinyl Co A in lipid metabolism  
   (May 2006)

**Prostaglandins :**
26. Illustrate the reactions catalyzed by Endoperoxide synthase Explain its regulation and importance  
   (Sept 2005)
27. Illustrate diagrammatically prostaglandins synthesis, inhibition and 3 clinical applications  
   (Sept 2006)
28. Discuss the biological compounds derived from: Arachidonic acid. (May 2009)
29. Give the biochemical explanations of Use of aspirin as an anti-inflammatory drug.  
   (May 2004)

**Cholesterol :**
30. a- Illustrate the steps of synthesis of mevalonate.  
   b- What is meant by feedback inhibition and its role in cholesterol synthesis.  
   (May 1996)
31. Write the reactions catalyzed by hydroxymethy coA reductase.(HMGCOA reductase and mention its importance and regulation  
32. Explain: Regulation of cholesterol biosynthesis with reference to atherosclerosis.  
   (Sept 2000)
33. Explain how acetyl CoA is converted to HMG CoA. Mention how HMG CoA is converted to mevalonate & acetoaetate .  
   (Sept 2000)
34. Mention three causes of ketosis and three causes of hypercholesterolemia  
   (Sept 2001)
36. Explain Regulation of cholesterol synthesis and conditions associated with hypercholesterolemia.  
   (Sept 2004)
37. A hyper cholesterolemic patient was given a medication that acts in the key enzymefor cholesterol synthesis.  
   a) what is the name of this enzyme, its substrate and product?  
   b) illustrate the fate of this substrate inside the mitochondria.  
   c) Give one genetic cause for hypercholesterolemia  
   (2 marks)(1 mark). (2012)
38. A child with homozygous familial hypercholesterolemia was given a new medication to inhibit the synthesis of one of the apolipoproteins:  
   b) Describe the inherited defect in this child.  
   c) What is the apolipoprotein targeted by the new drug?  
   (1 mark)
d) What is the accepted plasma cholesterol concentration? (1 mark)
e) Illustrate the regulated reaction of cholesterol synthesis. (2 marks) (Sept 2013)

39. A 60 years old woman received her lab report that showed a plasma cholesterol concentration of 300 mg/dl
a. What is the accepted cholesterol concentration in normal plasma
b. What is the benefits of cholesterol for the body
c. Describe how woman differ from men physiologically regarding their plasma cholesterol and the consequences of this difference
d. If you were to give a drug that lowers the synthesis of cholesterol what enzyme should this drug target?
e. Describe the mechanism of cellular cholesterol uptake (May 2011)

40. A 40-year-old man received a lab report that showed a plasma cholesterol concentration of 230 mg/dL.
a. Comment on this result. (1 mark)
b. What diet would you recommend for this patient? (2 marks)
c. List the benefits of cholesterol for the body. (2 marks)
d. If you were to give a drug that lowers cholesterol synthesis, what enzyme should this drug target? (1 mark)
e. Explain what is meant by "good cholesterol" and "bad cholesterol". (2m) (June 2014)

41. A hypercholesterolemic patient was given a medication that acts on the key enzyme for cholesterol synthesis.
a) What is the name of this enzyme, its substrate and product? (2 marks)
b) Illustrate the fate of this substrate inside the mitochondria. (2 marks)
c) Give one genetic cause for hypercholesterolemia. (1 mark) (Sept 2014)

Lipoproteins:
42. Illustrate:
formation and fate of low and high-density lipoprotein (LDL'HDL) (May 1997)
43. Give an account on the low-density lipoproteins. (Sept 2003)
44. Explain the role of lipoprotein lipase in lipid metabolism. (Sept 1998)
(September 2003)(May 2006)
45. Mention metabolic importance and regulation of each of the following:
a- Lipoproteinlipase.

Diseases:
46. Explain Biochemical aspects of diabetics complication (May 2000)
47. Give the biochemical explanation of Ketoacidosis is a complication of uncontrolled diabetes mellitus. (September 2004)
48. Mention biochemical explanation of the following:
Diabetic coma is complication of uncontrolled diabetes mellitus. (May 2008)
49. Give the biochemical explanations of each of the followings:
   a-Development of cataract in uncontrolled diabetes mellitus
   b-Prevention of atherosclerosis by supplementation of dietary fibers.(May 2004)


51. Give the biochemical explanation of the following:
    HDL is anti-atherogenic. (September 2004)

52. Give the biochemical explanation of each of the followings:
    A) Familial hypercholesterolemia (September 2006)

53. A disease can result from deficiency of an enzyme. Describe the reaction
    catalyzed by the following enzymes and the effect of their deficiency:
    Lipoprotein lipase (2012)

54. A patient had generalized weakness and a low tolerance to prolonged muscle
    exercise. He was found to have carnitine deficiency.
    a) Explain the physiological role of carnitine (4 marks)
    b) Explain the cause of muscle weakness in this patient (1 mark)
    c) Name the sources of carnitine (2 marks) (June 2013)

   **Protein Metabolism**

1. Give one example of each of the following reactions
   - Transamination (September 2000)
   - Transmethylation
   - Oxidative deamination
   - Amino acid decarboxylation (September 2001)

2. Give short account on Transamination reactions and its medical
   importance (September 2004)

3. Explain diagrammatically the metabolic origin of each of the following urinary
   constituents:
   a. ammonia  b. creatinine  c. urea (May 2010)

4. Give complete reactions (formulae are not necessary) for 3 cytosolic reactions
   of urea synthesis. (May 2009)

5. Illustrate Synthesis of creatinine (May 2009)

6. Give an account on:
   Synthesis of epinephrine (Sept 2008)

7. Give two reactions (substrates, products and cofactors) for each of the
   following:
   - Metabolic reactions of glycine.
   - Utilization of succinyl CoA. (Sept 2008)

8. Discuss metabolic importance of glycine (Sept 2006)

9. Illustrate diagrammatically the following metabolic interconversions and
   mention enzyme and Cofactors:
   - Serine to glycine
   - Glutamic acid to glutamine (May 2008)
10. Enumerate important compounds derived from tyrosine and tryptophan.
   Explain one inborn Error in each.  
   (May 2008)
11. Illustrate diagrammatically the following reactions & mention the enzymes and cofactors:
   -Synthesis of nitric oxide from Arginine.  
   (Sept 2007)
   -Synthesis and importance of nitric oxide  
   (May 2006) (May 2005)
12. Mention 2 important compounds derived from:
   -Arginine
   -glycine
   -tryptophan  
   (May 2007)(Sept 2001)
13. Give short notes on:
   -reaction catalyzed by mitochondrial carbamoyl phosphate synthetase and its regulation
   -ammonia transport from peripheral tissues to liver  
   (May 2007)
14. Illustrate the reaction, its regulation, importance and consequence of defect in the enzyme:
   -Carbamoyl phosphate synthetase I  
15. Illustrate diagrammatically:
   -activated methyl cycle giving 2 examples of transmethylation reactions  
   (May 2007)
16. Illustrate the reactions catalyzed by each of the following enzymes. Explain its regulation and importance:
   -L glutamate dehydrogenase  
   (Sept 2005)
17. Illustrate diagrammatically the following biotransformations (enzymes & coenzymes are required)
   a- Methionine and Cystiene.
   b- Glycine to creatine  
   (Sept 2004)
18. Illustrate diagrammatically the following biotransformations:
   -Tryptophan to melatonin.
   -Norepinephrine to valinyl mandelic acid (VMA) form.  
   (May 2004)
19. A-Illustrate diagrammatically the following biotransformation. Mention enzymes and cofactors in each reaction
   1-Cysteine to pyruvate
   2-Phenylalanine to dopa .
   3-Serotonin to melatonin
   4- Glycine to hippuric
20. Illustrate diagrammatically the following biotransformation. Mention enzymes and co-factors for each:
   1-Tryptophan to serotonin.
   2-glutamine to succinate
   3-glycine to creatine phosphate
   4-Dopa to epinephrine  
   (May 2003)
21. Illustrate, mentioning the enzyme and coenzymes for each of the following biotransformation:
   a) Glutamic to GABA.                           (Sept 2001)
   b) DOPA to epinephrine.                        (May 2002)
   c) Serotonin to melatonin.                     (Sept 2001)
   d) Glycine to serine                           (May 2001)
   e) Arginine to ornithine.                      (May 2002)
   f) Aspartate to oxaloacetate                   (May 2001)
22. Explain the biological active component derived from glutamate.      (May 2001)
23. Give short notes on:
   - Synthesis and importance of glutathione
   - Regulation of urea synthesis                  (Sept 2005)
25. Give biochemical explanation for each of the following:
   - Glutamic acid is important in brain metabolism.             (May 2005)
26. Mention biochemical explanation of the followings:
   - Hyperammonemia is toxic to brain.                           (May 2008)
   - Hyperammonemia may occur in patients with Von Gierk disease. (May 2008)
27. Explain each of the following:
   - Phenylalanine hydroxylase deficiency                      (Sept 2008)
28. Mention thereaction catalyzed by the following enzyme, consequence & name of disease resulting from the deficiency Phenyl Alanine hydroxylase. (May 2009)(May 2012)
29. Mention the deficient enzyme in each of the followings:
   - albinism                                                (May 2003)(May 2002)
   - phenylketonuria                                         (May 2003)(May 2007)
   - maple syrup urine disease                               (May 2003)(May 2002)
   - Type 1 hyperammonemia                                   (May 2003)(May 2002)
31. A patient was found to have hypercholesterolemia with elevated carbamoyl phosphate.
   a) Name the deficient mitochondrial enzyme in this case. (1 marks)
   b) Describe the physiological sources of ammonia.         (3 marks)
   c) Illustrate how ammonia is eliminated by the brain.     (2 marks) (2012)
32. A newborn's urine was found on screening to contain phenyl-pyruvate.
   a) What is the defective enzyme in this child ?             (1 mark)
   b) Illustrate the reaction catalyzed by this enzyme         (2 marks)
   c) What is the aminoacid elevated in this child's blood   (1 mark)
   d) Name the important nitrogenous compounds whose synthesis is defective in this child (4 marks)
   e) What are other compounds whose synthesis is deficient in case of cofactor deficiency ?  (2 marks) (June 2013)
33. A patient with liver cell failure developed hyperammonemia and hepatic coma:
   (a) List the sources of blood ammonia in this patient. (2 marks)
   (b) Illustrate how the brain tissue gets rid of ammonia. (1 mark)
   (c) Explain the possible mechanism of ammonia toxicity to the brain. (2m) (Sept 2013)

34. A 12-year-old girl suffers drowsiness after high protein meals. She had a brother who died of hyperammonemia at the age of 9 days. Deficiency of ornithine transcarbamoylase (OTC) in family members is suspected. (June 2014)
   a. Illustrate the reaction normally catalyzed by this enzyme. (1 mark)
   b. Explain why this enzyme deficiency is suspected. (1 mark)
   c. Explain why there is increased uridine synthesis with this enzyme deficiency. (1 mark)
   d. In all cases of hyperammonemia, there is high concentration of one aminoacid in the plasma. Illustrate the reaction for synthesis of this aminoacid. (3 marks)
   e. Before the patient's brother died, he was given benzoate and phenylacetate attempting to improve his condition. Illustrate the mechanism of action of these two agents.

35. A patient was found to have hyperammonemia with elevated carbamoyl phosphate:
   a) Name the deficient mitochondrial enzyme in this case. (1 mark)
   b) Illustrate two biochemical reactions that produce ammonia. (4 marks)
   c) Illustrate how ammonia is eliminated by the brain. (2 marks) (Sept 2014)

36. A newborn was screened for metabolic errors and was found to have high phenylalanine concentration in the plasma:
   (a) What is the possible enzyme deficient in this baby? (1 mark)
   (b) Illustrate the reaction catalyzed by this enzyme, showing the cofactor needed. (2 marks)
   (c) List the important compounds derived from this aminoacid. (2 marks) (Sept 2013)

37. A cancer patient was given the folate antagonist methotrexate:
   (a) Illustrate the reaction directly inhibited by methotrexate. (2 marks)
   (b) Explain the importance of folic acid for cancer cells. (2 marks)
   (c) What is the food that antagonizes the given drug? (1 mark) (Sept 2013)

**Collected Questions Around Metabolism chapters**

1. Two metabolic reaction utilizing nicotinic acid as co-enzyme (May 1996)
2. Explain: - metabolic importance of NADH+H (Sept. 2000)
   - synthesis of citrate and its regulatory effect on TCA cycle and lipogenesis. (May 2004)
3. mention the names of two enzymes utilizing each of the following:
   (nadp - tpp - biotin - coash - fad) (2001 September)

4. Enumerate 3 NAD linked dehydrogenases having different functions as regards carbohydrates, lipids, and protein metabolism respectively. Mention the reaction catalyzed by each. (3 marks) (2003 May)

5. Give 3 different examples of FADH2 forming reactions. What are the fates of FADH2 (8 marks)

6. Give 3 examples of NADPH forming reactions. Explain its role in RBCs and xenobiotic Metabolism

7. Explain: role of shuttle system in transport of reduced equivalent to mitochondria
   - Illustrate synthesis and fate of citrate in different metabolic pathways (2006 Sept)

8. Mention the deficient enzyme in each of the followings: “7 marks”
   1- albinism
   2- essential pentosuria
   3- hemolytic anemia
   4- phenylketonuria
   5- alkaptonuria
   6- maple syrup urine disease
   7- severe galactosemia (2007 May)

9. A) Glycerol is a substrate for gluconeogenesis & lipogenesis. Explain. (Regulation is required when present). (17M)
   B) Decarboxylation reactions for can be oxidative or non-oxidative. Give examples for each. (Enzymes & Cofactors are required). (2007 Sept)

10. Hypoglycemia may be due to an inborn error in carbohydrate metabolism or impaired fatty acid oxidation (2007 Sept)

11. Give two reactions (substrates, products and cofactors) for each of the following: (6 Marks each):
    - Utilization of succinyl CoA
    - Generation of reduced FAD. (2008 Sept)

12. Give complete reactions (formulae are not necessary) for each of the following:
    a) 2 reactions generating oxaloacetate in mitochondria. (4 marks)
    b) 2 reactions utilizing succinyl CoA. (2009 May)

13. Give an example of one enzyme which is regulated by covalent modification and another which is regulated by non-covalent modification. For each of the two enzymes:
    a. Show the reactants, products, and cofactors that are needed for the reaction to go.
    b. Show how these modifications; negatively or positively affect the related pathways (6 marks) (2010 May)
14. A diabetic patient forgot to take his insulin injections for a few days and developed ketoacidosis:

(a) List the functions of insulin in carbohydrate and lipid metabolism. (3 marks)
(b) Explain the cause of ketoacidosis in this patient. (2 marks) (Sept 2013)

**Integration of Metabolism**

1. Metabolic changes in liver during prolonged starvation (8 Marks)(2003 Sept)
2. Control of hepatic metabolism in the well fed and starved states by allosteric effectors (8 Marks)(2005 sept)
3. Explain the metabolic changes in adipose tissue in response to low and high insulin/glucagon ratio with reference to their regulation( 18 MARKS) (2006 may)
4. Metabolic changes in liver and skeletal muscle during starvation .(12)
5. Explain :- the regulation of hepatic metabolism during the well fed & starved states by covalent modification of enzymes. (12M) (2007 sept)
6. Mention the role of the liver in well fed state as regards CHO & lipid metabolism.(10 marks) (2009 may)
7. Epinephrine and Cortisol can stimulate glucose output from liver cells by different mechanisms. Show how each of them regulate the metabolic pathways that increase blood glucose level. (6 marks) (2010)

**Xenobiotics and Free radicals**

1. Explain each of the following:
   - Role of cytochrome p450 in xenobiotic metabolism (may 2000)
   - Characteristics of cytochrome P450 (sep. 2008)
   - Cytochrome P450 & its metabolic role giving 2 examples.(Sep 2007)
2. Give short account on
   - Cytochrome p450: properties, metabolic role and effect on drugs interaction (may 2008)
   - functions of copper giving 3 examples of copper containing proteins (September 2006)
   - different types of antioxidants including antioxidant enzyme system. (Sep 2004)
   - natural anti-oxidants. (May 1999)
   - sources of free radicals and antioxidants. (Sep 2005)
   - antioxidant enzymes and vitamins (Sep 2007)
   - Four intracellular antioxidants (Sep 2008)
3. Define free radicals giving 3 examples. What are their sources and damaging effects? (May 2004)
   Explain briefly radicals scavenging enzymes system. (Sep 2006)
Vitamins & Minerals and Nutrition

1. Give the biochemical explanations of B6 deficiency may result in pellagra (May 2004)

2. Mention the names and functions of 4 members of Vit B complex and the names and functions of 4 co-enzymes derived from them.
   -causes and manifestations of B12 deficiency (Sep 2007)
   -B12 or Folate deficiency results in anemia (May 2008)

3. Explain Causes and deficiency manifestations of niacin (Sep 2004)

4. Discuss functions and deficiency of Tetrahydrofolate. (May 2000)

5. Give the biochemical explanations of Night blindness in vitamin A deficiency. (May 2004, May 2005)

6. Illustrate diagrammatically visual cycle and explain briefly one deficiency manifestation of vitamin A. (May 2007)

7. Explain the absorption, transport of vit A and is role in visual cycle (Sep 2000)

8. Discuss functions and deficiency of Retinoids (May 1998)


10. Give one main function and one deficiency manifestation for Retinol (Sep 2008)

11. Give the biochemical explanations of Deficiency of vitamin C may cause anemia. (Sep 2004)

12. Discuss functions and deficiency of L-ascorbic acid.

13. Discuss chemistry, sources, and deficiency of L-ascorbic acid. (Sep 2000)

14. Explain Four functions for vitamin C. (May 2004)

15. Physiological role and deficiency manifestations of vitamin C. (May 2009)

16. Give one main function and one deficiency manifestation for L-ascorbic acid (Sep 2008)

17. Give one example and write the structural formulae of each of the following:
   -Ascorbic acid (structure only: Sep 2002)

18. Give the biochemical explanations of each of the followings Vitamin D is considered as atypical vitamin and a hormone (Sep 2004)


20. The activation and function of Vit D3.
   -causes and manifestations of Vitamin D3 (May 2000, Sep 2002, May 2003, function only: May 2006)

21. Give one main function and one deficiency manifestation for Cholecalciferol (Sep 2008)
22. Discuss functions and deficiency of Vitamin K. (May 2000, Sep 2006: & causes of deficiency)

23. Give short account on: functions of vitamin K. causes & manifestations of its deficiency
   (Sept 2003, May 2004, May 2008: function only)

24. Give one main function and one deficiency manifestation for:
   \( \alpha \)-Tocopherol
   (Sep 2008)

25. Illustrate diagrammatically: 3 biotin dependant reactions. Explain their neurological importance and regulation.
   (May 2005)

26. Mention the name of deficient vitamin in the following conditions:
   Or give the name of the vitamin used in treatment of:
   - Rickets. (Sept 1999, May 2002)
   - Xerophthalmia. (May 2002, Sep 2007)
   - Night blindness. (Sep 2003)
   - Osteomalacia. (Sep 2003, Sep 2007)
   - megaloblastic anemia. (Sep 2007)

27. Enumerate:
   A-2 vitamins containing sulfur. Mention their co-enzymes and deficiency symptoms
   (Sept 2000, Sept 2004)
   B- 3 water-soluble vitamins. Give one enzyme derived from each one and its function. Give one deficiency manifestation for each vitamin. (May 2005)
   C-three hydrogen carriers derived from 3 different vitamins. Give the deficiency symptoms of two of these vitamins. (Sept 2005)
   D- antioxidant enzymes and vitamins (Sept 2007)

28. For each of the following vitamins give the coenzyme(s) and deficiency manifestations.
   (12 Marks)
   - Vit. B1. (Sept 2001)
   - Niacin. (Sept 2001)
   - Folic acid. (Sept 2001, Sept 2006)
   - Thiamine (Sept 2006, May 2007)
   - vitamin B6 (Sept 2006)
   - Biotin (May 2007)
   - riboflavin (May 2007)
   - Niacin - Pantothenic acid – Biotin (May 2008: name and function)
   - Thiamine, Riboflavin, Niacin, Pyridoxin, Folic acid (Sep 2008: only name)

29. Give one example and write the structural formulae of each of the following:
   - Water soluble vitamins containing six carbon atoms. (May 2001)
   - Fat soluble vitamin with antioxidant activity (Example only: May 2003)
30. Vitamins in the diet are important for synthesis of coenzymes. Name the vitamin required for synthesis of coenzyme A. (1 marks) (2012)

31. A farm boy used to ingest raw eggs every day. He developed generalized weakness and poor growth. Laboratory investigations revealed lactic acidosis with abnormally high plasma levels of pyruvate and alanine.
   a) Name the vitamin defective in this patient (1 mark)
   b) Name the enzymes affected in this patient (3 marks)
   c) Illustrate the chemical reactions for inter-conversion of pyruvate, alanine and lactate (4 marks)
   d) Explain the failure of alanine to produce glucose in this patient (2 m) (June 2013)

32. A pregnant woman was advised to take folic acid supplement. (June 2013)
   a) Explain the biochemical importance of folic acid in this case (4 marks)
   b) Describe the importance of vitamin B12 for the function of folic acid (3 marks)

33. A 3 year old child developed rickets, was given a medication and the parents were advised to expose their child to more sun: (Sept 2013)
   a) What vitamin and what mineral was this patient given? (1 mark)
   b) What is the beneficial effect of sunrays in this case? Give the names of the substance produced and its precursor. (1 mark)
   c) Give other names of ergocalciferol and calcitriol. (1 mark)
   d) Describe the mechanism of action of the active form of the vitamin. (2 marks)

34. A man weighing 70kg lives a sedentary life style and has a typical daily dietary intake of 250 g carbohydrate, 10 g fats, 10 g proteins. (100 g proteins in Sept 2014 exam)
   a) Calculate his daily caloric intake. (2 marks)
   b) Calculate his daily caloric needs. (2 marks)
   c) Describe his metabolic state: gaining weight, losing weight or in caloric balance. (1 marks) (May 2012)

35. A man has a typical daily dietary intake of 500 g carbohydrates, 30 g fats and 100 g proteins. Calculate the daily caloric intake. (June 2013)

36. (May 2011) (Sept 2014) A 2.5 years old boy showed signs of deficient bone mineralization. The boy belonged to high social class parents who took good care of his nutrition and exposed him to very little outside air and sun
   a) What nutrients are necessary for normal bone mineralization?
   b) What is the defective nutrient in this patient
   c) Explain the role of the parents' overprotection in developing the boy's condition
   d) Illustrate the normal activation of this intended nutrient
   e) Describe the molecular mechanism of action of the activated nutrient

37. A 4-year-old child had swelling joints and bleeding gums. The child always refused intake of vegetables and fruits.
a. What is the most probable deficient vitamin in this child and what is most probable diagnosis? (1 mark)
b. What is the biochemical basis of the child's condition? (2 marks) (June 2014)

38. A 63-year-old female with arthritis on non-steroidal anti-inflammatory drug medication developed bleeding gastric ulceration which led to iron deficiency anemia.
   a. Illustrate the pathway inhibited by this medication. (2 marks)
   b. Describe the normal iron absorption and transport. (3 marks)
   c. List the causes of iron deficiency anemia. (2 marks)
   d. Describe the regulation of heme synthesis. (2 marks) (June 2014)

39. A 40-year-old woman developed obstruction of the common bile duct, with yellow discoloration of skin. A blood analysis was ordered.
   a) Name the metabolite that causes this abnormal skin color. (1 mark)
   b) Outline the pathway for production of this metabolite. (2 marks)
   c) What is the color of this patient's urine? Why? (1 mark)
   d) What is the color of this patient's stool? Why? (1 mark) (Sept 2014)

40. Health official have been studying a project for combating anemia in school children by adding iron to the flour used for making bread. (Sept 2014)
   a) Illustrate the chemical reaction in hemoglobin synthesis in which iron is needed. (1 mark)
   b) Describe the factors that affect iron absorption. (2 marks)
   c) Name other compounds that contain the same prosthetic group of hemoglobin. (2 marks)

June 2013

1. A farm boy used to ingest raw eggs every day. He developed generalized weakness and poor growth. Laboratory investigations revealed lactic acidosis with abnormally high plasma levels of pyruvate and alanine.
   a) Name the vitamin defective in this patient. (1 mark)
   b) Name the enzymes affected in this patient. (3 marks)
   c) Illustrate the chemical reactions for inter-conversion of pyruvate, alanine and lactate. (4 marks)
   d) Explain the failure of alanine to produce glucose in this patient. (2 marks)

2. A 3-year-old male child developed fever, rapid pulse and weakness after eating fava beans. After 4 days, his skin and eyes were yellow and his urine was brownish. Blood analysis revealed low hemoglobin and high total bilirubin.
   a) Name the enzyme defective in this child. (1 mark)
   b) Write the reaction catalyzed by this enzyme. (2 marks)
   c) Explain the biochemical basis for low hemoglobin in this child. (4 marks)
   d) Why is the urine brownish in this patient? (1 mark)

3. A newborn's urine was found on screening to contain phenyl-pyruvate.
   a) What is the defective enzyme in this child? (1 mark)
   b) Illustrate the reaction catalyzed by this enzyme. (2 marks)
c) What is the aminoacid elevated in this child's blood? (1 mark)
d) Name the important nitrogenous compounds whose synthesis is defective in this child (4 marks)
e) What are other compounds whose synthesis is deficient in case of cofactor deficiency? (2 marks)

4. A patient had generalized weakness and a low tolerance to prolonged muscle exercise. He was found to have carnitine deficiency.
   a) Explain the physiological role of carnitine (4 marks)
   b) Explain the cause of muscle weakness in this patient (1 mark)
   c) Name the sources of carnitine (2 marks)

5. A pregnant woman was advised to take folic acid supplement.
   a) Explain the biochemical importance of folic acid in this case (4 marks)
   b) Describe the importance of vitamin B12 for the function of folic acid (3 marks)

6. A man has a typical daily dietary intake of: 500 g carbohydrates, 30 g fats and 100 g proteins. Calculate the daily caloric intake

Sept 2013

1. A diabetic patient forgot to take his insulin injections for a few days and developed ketoacidosis:
   (a) List the functions of insulin in carbohydrate and lipid metabolism (3 marks)
   (b) Explain the cause of ketoacidosis in this patient (2 marks)

2. Following an attack of enteritis, a 20 year old student suffered cramps and diarrhea upon milk ingestion:
   (a) What is the possible cause of this patient’s condition? (1 mark)
   (b) Illustrate the chemical reaction defective in this patient (1 mark)
   (c) Describe other related chemical reactions that may also be defective in this patient (1 mark)
   (d) Describe how glucose is absorbed from the intestinal lumen (2 marks)

3. A baby was brought to a specialized medical center in a bad condition. The child was properly investigated and found to have deficiency of the enzyme uridyl transferase needed for galactose metabolism:
   (a) Illustrate the chemical reaction catalyzed by this enzyme (2 marks)
   (b) Describe the consequences of this deficiency (1 mark)
   (c) How should this baby be managed (1 mark)
   (d) How can this patient form the galactosides needed by the body? (1 mark)

4. A child with homozygous familial hypercholesterolemia was given a new medication to inhibit the synthesis of one of the apolipoproteins:
   (a) Describe the inherited defect in this child (1 mark)
   (b) What is the apolipoprotein targeted by the new drug? (1 mark)
   (c) What is the accepted plasma cholesterol concentration? (1 mark)
   (d) Illustrate the regulated reaction of cholesterol synthesis (2 marks)
5. A patient with liver cell failure developed hyperammonemia and hepatic coma:
   (a) List the sources of blood ammonia in this patient. (2 marks)
   (b) Illustrate how the brain tissue gets rid of ammonia. (1 mark)
   (c) Explain the possible mechanism of ammonia toxicity to the brain. (2 marks)

6. A newborn was screened for metabolic errors and was found to have high phenylalanine concentration in the plasma:
   (a) What is the possible enzyme deficient in this baby? (1 mark)
   (b) Illustrate the reaction catalyzed by this enzyme, showing the cofactor needed. (2 marks)
   (c) List the important compounds derived from this aminoacid. (2 marks)

7. A cancer patient was given the folate antagonist methotrexate:
   (a) Illustrate the reaction directly inhibited by methotrexate. (2 marks)
   (b) Explain the importance of folic acid for cancer cells. (2 marks)
   (c) What is the food that antagonizes the given drug? (1 mark)

8. A 3 year old child developed rickets, was given a medication and the parents were advised to expose their child to more sun:
   (a) What vitamin and what mineral was this patient given? (1 mark)
   (b) What is the beneficial effect of sunrays in this case? Give the names of the substance produced and its precursor. (1 mark)
   (c) Give other names of ergocalciferol and calcitriol. (1 mark)
   (d) Describe the mechanism of action of the active form of the vitamin. (2 marks)

9. A patient was diagnosed as having mitochondrial myopathy with lactic acidosis and inability to do aerobic exercise:
   (a) Explain why lactic acidosis develops in this patient. (2 marks)
   (b) Illustrate the mitochondrial electron transport chain reaction that involves oxygen. (1 mark)
   (c) Describe the mechanism of ATP production by the mitochondria. (1 mark)
   (d) Describe the action of thermogenin on this mechanism. (1 mark)

Answer all the following questions:
1. A 3-year-old male child developed fever, rapid pulse, and weakness after eating fava beans. After 4 days, his skin and eyes were yellow and his urine was brownish. Blood analysis revealed low hemoglobin and high total bilirubin.
   a. Name the enzyme defective in this child. (1 mark)
   b. Illustrate the reaction catalyzed by this enzyme. (2 marks)
   c. Describe the oxidation-reduction cycle of glutathione in red blood cells. (4 marks)

2. A 40-year-old man received a lab report that showed a plasma cholesterol concentration of 230 mg/dL.
   a. Comment on this result. (1 mark)
   b. What diet would you recommend for this patient? (2 marks)
c. List the benefits of cholesterol for the body. (2 marks)
d. If you were to give a drug that lowers cholesterol synthesis, what enzyme should this drug target? (1 mark)
e. Explain what is meant by "good cholesterol" and "bad cholesterol". (2 marks)

3. A 4-year-old child had swelling joints and bleeding gums. The child always refused intake of vegetables and fruits.
   a. What is the most probable deficient vitamin in this child and what is most probable diagnosis? (1 mark)
   b. What is the biochemical basis of the child's condition? (2 marks)

4. A 63-year-old female with arthritis on non-steroidal anti-inflammatory drug medication developed bleeding gastric ulceration which led to iron deficiency anemia.
   a. Illustrate the pathway inhibited by this medication. (2 marks)
   b. Describe the normal iron absorption and transport. (3 marks)
   c. List the causes of iron deficiency anemia. (2 marks)
   d. Describe the regulation of heme synthesis. (2 marks)

5. A 12-year-old girl suffers drowsiness after high protein meals. She had a brother who died of hyperammonemia at the age of 9 days. Deficiency of ornithine transcarbamoylase (OTC) in family members is suspected.
   a. Illustrate the reaction normally catalyzed by this enzyme. (1 mark)
   b. Explain why this enzyme deficiency is suspected. (1 mark)
   c. Explain why there is increased uridine synthesis with this enzyme deficiency. (1 mark)
   d. In all cases of hyperammonemia, there is high concentration of one aminoacid in the plasma. Illustrate the reaction for synthesis of this aminoacid. (3 marks)
   e. Before the patient's brother died, he was given benzoate and phenylacetate attempting to improve his condition. Illustrate the mechanism of action of these two agents. (2 marks)

6. A urine sample had a reducing sugar as tested by copper sulfate-based reagent but was negative for glucose oxidase-based urine dipsticks.
   a. If the patient was a breast-fed infant and after full investigation the parents were warned against any milk feeding of this infant. Name the most probable enzyme deficient in this case and illustrate the chemical reaction it normally catalyzes. (2 marks)
   b. List three other possible reducing sugars in this urine sample and indicate the condition leading to each one. (3 marks)
   c. From your study of carbohydrate metabolism, name another condition in which patients avoid milk intake and illustrate the deficient reaction. (2 marks)
   d. With no milk intake, illustrate the biochemical reaction by which the patient gets active galactose for synthetic purposes. (1 mark)
   e. Illustrate another reaction, not involved in carbohydrate metabolism, that when deficient leads to milk restriction. (2 marks)
**Sept 2014**

**Answer the following question:**

1. A hypercholesterolemic patient was given a medication that acts on the key enzyme for cholesterol synthesis
   a) What is the name of this enzyme, its substrate and product? (2 marks)
   b) Illustrate the fate of this substrate inside the mitochondria. (2 marks)
   c) Give one genetic cause for hypercholesterolemia. (1 mark)

2. A ten year old boy had repeated attacks of hemolysis that followed eating beans. His condition was diagnosed as a hereditary enzyme deficiency.
   a) What is the deficient enzyme? (1 mark)
   b) Illustrate the reaction catalyzed by this enzyme. (1 mark)
   c) Explain why hemolysis takes place in this patient. (3 marks)

3. A patient was found to have hyperammonemia with elevated carbamoyl phosphate.
   a) Name the deficient mitochondrial enzyme in this case. (1 mark)
   b) Illustrate two biochemical reactions that produce ammonia. (4 marks)
   c) Illustrate how ammonia is eliminated by the brain. (2 marks)

4. A 2.5 years old boy showed signs of deficient bone mineralization. The boy belonged to high social class parents who took care of his nutrition, and exposed him to very little air and sun.
   a) What nutrients are necessary for normal bone mineralization? (1 mark)
   b) What is the deficient nutrient in this patient? (1 mark)
   c) Explain the role of the parents’ overprotection in developing the boy’s condition. (2 marks)
   d) Illustrate the normal activation of this intended nutrient. (2 marks)
   e) Describe the molecular mechanism of action of the activated nutrient. (2 marks)

5. A diabetic patient was admitted to the hospital with high blood glucose and glucosuria.
   a) List the hormones that increase blood glucose. (2 marks)
   b) How would you estimate the average blood glucose in this patient in the last two months? (1 mark)
   c) List the causes of glucosuria. (2 marks)

6. A man weighing 70 kg lives a sedentary life style and has a typical daily dietary intake of: 250 g carbohydrates, 10 g fats and 100 g proteins.
   a) Calculate his daily caloric intake. (2 marks)
   b) Calculate his daily caloric needs. (2 marks)
   c) Describe his metabolic state: gaining weight, losing weight or in caloric balance. (1 mark)
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   a) Illustrate the chemical reaction in hemoglobin synthesis in which iron is needed. (1 m)
   b) Describe the factors that affect iron absorption. (2 marks)
   c) Name other compounds that contain the same prosthetic group of hemoglobin. (2 marks)

**Answers**

**Signal Transduction**

- Give short notes on:
  1- page 25 (second messanger of kinases) 2- page 18
  3- page 24 (cGMP) 4- page 21

- Explain:
  1- page 18 / glucagon, catecholamines 2- page 15
  3&4&7- page 18 5- page 25
  6- page 21

- Discuss:
  1&2- page 9 (Hormonal receptors) / page 10 (types) / page 12 (regulation)

- Enumerate:
  1- page 18 (different 2nd messanger + cAMP)
  2- page 11 (cell membrane receptors) / page 25

- Compare between: Between page 15 and 18

**CHO Metabolism**

- Give short notes on:
  1- page 40- page 47 (anaerobic paragraph) 3- the box in page 111
  4- page 72 - 80 5&6- page 53 / page 51 (2nd paragraph) / page 108
  7- page 57 – 58

- TCA cycle:
  1- page 61 – 69 / page 174 2- page 67 – 69
  3- UDP glucose: page 87-88-101-112 . citrate as Q1
  4- page 93 5&6- as Q3 7-page 69

- Gluconeogenesis:
  1&4- page 108 2- page 77-72
  3- as Q2 + page 71 (last paragraph)

- Rest of chapter:
  1- page 116 2- page 98 3&4- page 118 5- page 51 – 95
  7- page 84 – 95 8- G-6P DH / galactokinase or galactose-1P
  9- as Q7 + page 198 10- b) page 84 / 110 11- page 76 – 77
12- page 46 (last paragraph)  13- a)page 116  b)HbA1c  c)page 118
14- G6Pase / L-xylulose reductase / galactokinase or falactose-1P / Aldolase B / G6PDH
Collective Questions :
1- a)During well fed state;
   1. Glycolysis : from which some intermediates or products can be used for other aim
      rather than energy production;
      a. Pyruvate → Acetyl CoA → Kreb’s cycle.(NADH+H , ATP)
      b. DHAP → Glycerol-3-P → TAGs synthesis (Lipogenesis).
      c. Pyruvate → Acetyl CoA → Malonyl CoA → Fatty Acid synthesis .
      d. Pyruvate → Acetyl CoA → Cholesterol synthesis.
      e. Pyruvate → Lactate (anerobic glycolysis in RBCs and exercising muscles)
      f. 2,3 BPG (anerobic glycolysis in RBCs during hypoxia)
   2. Hexose Mono Phosphate pathway.
   b)During fasting ; 1. Glycogenolysis . 2. Gluconeogenesis
2- page 69 - 80             3- no.6 / no.1-3 / last step in glucuronic pathway
4- a) page 52-107  b)page 98  c)no10 in glycolysis  d)page 69  e)Enolase
5- page 52-69-80               6- page 50 – 78               7- Glycolysis,steps7,10-succinate thiokinase
8- page 39 – 103                9- Von Gierke's disease / congenital haemolytic anaemia / haemolytic anaemia / fructose intolerance 10- page 70 – 56
11- Sources of Succinyl CoA:1. alpha keto-glutarate 2. propionyl CoA
   Fates of Succinyl CoA:1. Kreb’s cycle; α KG → Succinyl CoA → Succinate → Fumarate →…..
2. Ketolysis; (Thiophorase in Extra-hepatic Tissues)
3. Heme synthesis {ALA synthase (B6 ) }
12- a)G6PDH  b)page 103  c)page 110

Bioenergetics
1- page 144 – 150       3- page 152       4- as Q7 in collected questions/ page 137
1- page 144       2- page 150 / 152       3-page 139 (last paragraph) 4- page 149

Lipid metabolism
FA synthesis and oxidation answers:
1&5- page 190 (process of mobilization of stored fats)
2- pages (174 – 175) / page 69 (allosteric regulation of citrate synthase)
3- page 186 (regulatory hormones - long term regulation) / the box in page 215
4- page 187 (from activation of glycerol till page 189)
6&7- page 176 (the synthesis of malonyl CoA) / page 184 (regulation of fatty acid synthesis)
8&9- page 193 (transport of fatty acids across the mitochondrial membrane) / page 194 (carnitine deficiencies)
10&11- *page 192 (write briefly about activation of fatty acids)
*page 195 (Beta oxidation of fatty acids briefly and its end products)
12- page 200 (regulation of fatty acid oxidation) / the energy released is 146 ATP
and its calculation is in page 197
13- a) check the answer of 6\&7 questions  
b) check the answer of 8\&9 questions  
14- page 200 (alternative ways of fatty acid oxidation)  
15- page 95 (Von Gierke's disease) / page 194 (carnitine deficiencies)  
16- a) the pathway and steps are from page 195 (Beta oxidation)  
b) 1acetyl CoA + 1propionyl CoA + 1NADH and 1FADH$_2$  
the amount of energy is 17 ATP then remove 2 ATP of activation so the net is 15  
ATP / propionyl CoA for gluconeogenesis, then tell how acetyl CoA and cofactors  
enter the TCA cycle and give energy as ATP  
17- explain briefly the pros of mobilization of stored fats at page 190, and beta  
oxidation at page 195  
18- check second question answer  
Ketogenesis answers:  
19- page 208 (steps of oxidation of ketone bodies)  
20- page 206 (the first 3 steps) / page 228 in cholesterol biosynthesis  
21- a) activation of fatty acids in TAG synthesis or FA oxidation (page 189 or 192)  
b) page 208  
22- page 206 (steps of ketogenesis). It gives B-hydroxybutyrate or acetone or  
acetoacetyl CoA by thiohorase (mention the reactions)  
23- page 208  
24- page 204 from (under normal physiological conditions …)  
25- formation: page 62, 4th reaction / utilization in page 208  
26- page 220 and 221  
27- page 220 and 221 / page 222 (inhibition by drugs)  
28- page 220 (synthesis of prostaglandins)  
29- the box in page 223 and page 224  
Cholesterol answers:  
30- a) page 228 (steps A and B)  
b) page 230 (regulation of cholesterol level)  
31- page 228 (synthesis of mevalonic) / page 230 (regulation of cholesterol level by  
covalent and gene expression)  
32- page 230 (regulation) / page 260 (cholesterol problem in atherosclerosis)  
33- check the answer of Q.20  
34- page 210 (causes of ketosis) / first topic in page 259 of increased cholesterol  
levels conditions  
35- page 248 the last paragraph  
36- page 230 (regulation) / page 259 (first paragraph)  
37- a) the full reaction in page 228 (synthesis of mevalonate)  
b) ketogenesis in page 206  
c) page 259 (first paragraph)  
38- a) (140-200 mg\%) page 230  
b) page 226, first paragraph  
c) page 260 last paragraph / page 253  
d) HMG CoA reductase in page 232 (inhibition by drugs)  
e) page 248, 249  
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Protein metabolism

1- Transamination page 15 / Transmethylation page 32 / Oxid D.A page 11,12 / AA D.C page 51
2- page 15,163- a) deamination page 11 / b) page 32 / c) page 22
4- page 21,22 steps 3,4,5- page 326- page 60,61
7- a) page 30,32 b) page 30 8- page 309- a) page 28-B / b) page 50
10- tyrosine : page 60 and pheochromocytoma in page 61
trypotphan : page 55 and pellagra page 59
11- a) page 68 b) page 68,69
12- a) page 68 b) page 30
13- a) page 20 / regulation in page 23 b) transdeamination and page 18
14- page 20 / deficiency in page 2515- page 4816- page 13
17- a) page 48 b) page 3218- a) page 57,58 b) page 63
19- 1) page 44 2) page 60,61 3) page 57,58 4) page 31
20- 1) page 55,56 2) p14 to glutamate + p13 by DA + krebs cycle 3) page 32 4) page 60,61
21- a) p50 b) p60,61 c) p57,58 d) p40 e) p22 f) p16
22- page 5023- a) page 35 b) page 2324- page 24,25
25- page 51 26- page 25 27 & 28- phenylketonuria page 66
29- a) tyrosinase p63 b) PhH p66 c) p55 d) p25
30- the same answer of 10 question
31- a) any enzyme of urea cycle except CPS1 b) sources p17 c) transamination + page 25

Collected questions around metabolism

1- many examples as in (glycolysis , PDH , krebs cycle ...)
3- p103 in part 1 / PDH + a KG DH + transketolase / in gluconeogenesis + ACC in FA synthesis + CPS 1&2 / PDH + a KG DH + FA CoA synthetase
4- PDH / FA synthase / L-G DH
5- Succinate DH (Kreb’s cycle) / Acyl CoA DH(β- oxidation of FAs) / Xanthine oxidase (purine catabolism) / D AA oxidase
6- p103,108 in part 1 + page 111 in part 2
8- tyrosinase / L-xylulose reducta / G-6P DH / PhH / homogentisate oxidase / a keto DH / Galactokinase (mild disorder), Galactose-1-P uridyl transferase (severe disorder)
*(remaining questions were answered before)
Integration of metabolism
1- p104  2- allosteric in p95,104  3- p98,106  4- p104,107
5- covalent modifications in p95,104  6- p96,99
7- p104 (enzymatic changes in fasting)

Xenobiotics and Free radicals
1- p111  3- p187,190,193,196  2- a)p111
b)Ferroxidase / Cytochrome c oxidase / Dopamine beta-hydroxylase / Monoamino oxidase / tyrosinase
c)p194  e)p190,194

Vitamins, Minerals and Nutrition
1- p59,150  2- p139 / p82,86
3- P147  4- p82  5&6&7- p158,154,155
8&9&10- p157  11- p136,137,138
18=>21- p166,169,170  22&23- p163,166
24- p160,162  25- p151
26- D / B6 / B12 / B1 / A / A / D / C / folate
27- a)B1 + pantothenic acid
29- C / E
30- pantothenic acid
31- a) [250x4 + 10x9 + 10x4] = 1130 Kcal
b)70x30 = 2100 Kcal  c)losing weight

June 2013
Case 1: a) Biotin (vitamin H )
b) Pyruvate carboxylase – propionyl coA carboxylase (Gluconeogenesis) – Acetyl coA carboxylase (Fatty acid synthesis) - CPS I (Urea cycle), CPS II (Pyrimidine synthesis)
c) page 56 in part 1 book . the illustration in the end of the page (write the reactions completely )
d) to produce glucose from alanine, alanine is converted to pyruvate then to oxaloacetate by pyruvate by pyruvate carboxylase enzyme then gluconeogenesis occurs
in this case defect in biotin causes failure in function of pyruvate carboxylase enzyme then failure to produce glucose from alanine (write the reactions )

Case 2: a) glucose 6 phosphate dehydrogenase enzyme
b) page 103 in part 1 book
c) page 110 in part 1 book
d) haemolytic anaemia , destruction of RBCs and free hemoglobin in blood excreted in urine

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Case 3:  
a) phenylalanine hydroxylase enzyme  
b) page 60 in part 2 book, the diagram in the page  
c) phenylalanine  
d) catecholamines (dopamine – epinephrine – norepinephrine) – melanin – thyroid hormones  
e) serotonin – melatonin – nicotinic acid

Case 4:  
a) page 193 in part 1 book, from the last paragraph of summary till the end of the process  
b) impaired tissue's ability to synthesize glucose during fasting state which lead to hypoglycemia  
c) page 194 in part 1 book

Case 5:  
a) page 82 in part 2 book, the first paragraph  
b) page 79 in part 2 book from the methyl THF topic + page 83 (Folate trap)

Case 6:  
1 gram of CHO give 4 Kcal / 1 gram of fat give 9 Kcal / 1 gram of protein give 4 Kcal
His daily caloric intake = (500 x 4 + 30 x 9 + 100 x 4) = 2670 Kcal
Chapter 1: Oral Cavity

1. Give a detailed account of the histological structure of human tongue (2004 May) (2005 May) & Give the reason for The free margin of the lip is red (2011)

2. Enumerate Different types of lingual papillae and mention their site and function. (June 2014) Describe the histological structurecorrelated to function of circumvallate papillae (May 2008) (Sept 2012)

3. give an account on the structure, site and function of taste bud (May 2007)

Chapter 2: Gastrointestinal tract

1. Give an account of the histological structure of the middle 1/3 of human oesophagus in relation to its functions (2003 September) - Mention the structural differences between Vagina & Oesophagus. (Sept 2012)

2. Structure adapts function :Discuss in relation to the mucosa of the fundus of the stomach. (May 1999)


4. In a table, compare between the fundic and the pyloric glands. Describe thehistological picture (LM & EM) and function(s) of the main cells present in both glands. (May 2008)

5. Discuss the structure of intestinal villus in relation to its function (May 2000)

6. Enumerate cells covering the villi and lining the crypts of small intestine (Sept 2008) & Give the reason for The presence of paneth cells in the basement membrane of intestinal crypts (May 2011)

7. Give a detailed account on the structure of the mucosa of the ileum. (Sept 2004)

8. Describe structure (LM & EM) & correlated functions of:
   a) Cells lining the intestinal mucosa (June 2013) & describe the structure of the most numerous one (Sept 2014)
   b) Enterocytes (Columnar absorptive cells) of intestine. (5m)(May 2009)(Sept 2008)
   c) M (Microfold) cells. (1.5 marks) (May 2009)

9. Give a detailed account of the structure and function of large intestine (May 2003-2010)

10. Evaluate the role of Frequent Goblet cells in the epithelial lining the large intestine. (Sept 2012)

11. Give a full account on rectoanal canal. (May 1998)
12. Compare between a section of the large intestine and a section of the appendix. (5 M) (Sep 2008)

13. Give an account on the glands and cells secreting mucous along the alimentary canal. (Sep 2007)


15. Describe in detail the cells involved in digestion & absorption of fat (May 2007)

**Chapter 3 : Gut associated glands**

1. Discuss the structure of different types of salivation acini in relation to function where you can find each type (10 Marks) (Sept 2006)

2. Give an account on the following: the structure of parotid gland (May 2002) & the duct system of parotid gland (different types & structure) (June 2013) (Sept 2014)

3. Evaluate the role of Myoepithelial cells around mucous acini. (May 2012)

4. Discuss in detail the pancreas (Sept 2004) & pancreatic acini (Sept 2013)/Pancreatic acinar cells (June 2014)

5. Discuss the structure and function of the island of Langerhans (2000 May) & Mention the name & the site of the cell responsible for diabetes mellitus (2011 May)

6. Discuss in detail the histological structure of the exocrine part of pancreas comparing it with the parotid gland (Sept 2003 – 2006 - 2012) (May 2009)


8. Define the classical hepatic lobule, the portal lobule and the liver acinus. (3 M) (Sept 2008 ) (May 2003)

9. Describe the structure and correlated functions of:


**Chapter 4 : Endocrine**


2. Discuss in detail the cells responsible for regulation of milk production and secretion (September 2003)& Acidophils in anterior pituitary gland (Sept 2013)/ Compare between the structure of Acidophils and basophils of pars distalis. (June 2014)
3. Discuss the histological structures involved in the milk secretion and ejection (September 2004)

4. The structure of mammary gland is controlled by pituitary hormone, Discuss (September 2006)

5. Mention the name and site of cell responsible for dwarfism (May 2011)

6. Discuss structure correlated to function Somatotrophs [3 marks] (May 2012)


9. Describe structure (LM & EM) and correlated functions of the zona fasciculata of the suprarenal cortex (Sept 2008-2014) & spongiocytes (May 2012)

10. Mention TWO stains for identification of the medulla from the cortex (May 2008)

11. Give a detailed account of adrenal medulla (May 2004-2007) & Chromaffin cells (June 2013)

12. Give an account of the structure of cells involved in regulation of calcium level in blood (May 2003) & Chief cells (June 2013)


14. In a table form, mention 3 structural difference between: Thyroid and lactating mammary gland (May 2011)

15. Describe the structure of the pineal body (Sept 2007) & pinealocytes (June 2013)

Chapter 5: Urinary


3. Describe the structure (LM&EM) and correlated function of Blood renal barrier. (June 2014)

4. Describe the structure & correlated functions of the components of glomerular filtration barrier (May 2009) (June 2013)

5. Give an account on mesangial cells (May 2008) (May 2011)

6. Discuss in detail the light microscopic structure of convoluted tubules of kidney with reference to fine structure (May 2003)

7. Distal convoluted tubules (Sept 2007)
8. Proximal convoluted tubules (Sept 2008-2013-2014) & Asses the value of: 
   Apical canaliculi in cells of proximal convoluted tubules (PCT)  
   (1 mark) (June 2013)
9. In a table form, compare between the structure of the proximal and distal 
   convoluted tubules of the kidney  
   (May 2010)(Sept 2012)
10. Give an account on loop of henle  
    (September 2006)
11. Give a detailed account of juxta-glomerular apparatus  
    (May 2004) (May 2005)
12. Give reason for: Macula densa cells lack basement membrane  
    (May 2011)
13. Describe the blood supply of kidney  
    (May 2001)
14. Write short note on the urinary bladder  
    (May 2001)
15. Correlate structure (LM&EM) to function of: Facet cells (Umbrella-shaped 
    cells) of the urinary bladder.  
    (June 2014)(3 marks)
16. In a table, compare between a section in the ureter and vas deferens 
    microscopically  
    (September 2007)
17. Give an account of male urethra  
    (May 2006-2007-2008)

Chapter 6: Male Reproductive system

1. Give full account on seminiferous tubule (May-2000) (May 2002)/ Enumerate 
   Different types of dividing germ cells of seminiferous tubules with reference to 
   type of division.  
   (3 Marks) (June 2014)
2. Give an account of spermatogenic cells  
   (September 2003)
3. Discuss in detail spermatogenesis  
   (May 2004) (May 2005)
4. Give an account on the primary spermatocytes  
   (Sept 2007)
5. Write an account on: Spermatogenic cells which undergo meiosis during 
   spermatogenesis. (May 2008)&proliferative cells of seminiferous tubules 
   (Sept 2013)
6. Describe the structure of the different spermatogenic cells present in the 
   adluminal compartment of the seminiferous tubules  
   (May 2010)
7. Discuss spermiogenesis  
   (May 2010)
8. Discuss cells forming the blood testis barrier  
9. Correlate structure (LM&EM) to function of Sertoli cells of testis. (Sept 2014)/ 
   Asses the value of:Tight junctions between the lateral processes of adjacent 
   sertoli cells (1m) (June 2013) /myoid cells around seminiferous tubules 
   (1m) (Sept 2013)
10. Discuss structure correlated to function of Interstitial cells of leydig (Sept 2012)
11. Give an account of male urethra  
12. In a table, compare between a section in the ureter and vas deferens micros- 
    copically (Sept 2007)(May 2012) & Epididymis and Vas deferens.3m 
    (June 2013)
13. Name the Extra testicular genital ducts. Mention the lining Epithelium and function of each  
(May 2008)
14. Enumerate in order the pathway of mature sperms till ejaculated with reference to the lining epithelium of each part  
(May 2011)
15. Discuss structure correlated to function of the hydrolytic enzymes in acrosomal cap  
(May 2012)
16. Give account on male accessory glands of male reproductive system  
(May 1998)
17. Describe the structure & function of the prostate gland  
(May 2009)

Chapter 7: Female Reproductive System

1. Give account on oogenesis  
(May 2001)
2. Describe the structure of mature graffian follicle of ovary  
3. Discuss in detail origin, structure, types and fate of corpus luteum  
(Sept 2001) (June 2013)
4. Discuss gonadotropes & their effect on ovarian follicles  
(May 2002)
5. Describe the microscopic picture of: Growing follicles  
(May 2008)
6. Give an account of the ovarian structures involved in ovulation  
(Sept 2003)
7. Give an account on the structure and correlated functions of the cortex of the ovary during luteal phase of the ovarian cycle  
(May 2010)
8. Give full account on the fallopian tube  
9. Give an account on the histological structure of the ampullary part of fallopian tube  
(September 2000)
10. Describe the structure of the endometrium during different phases of menstrual cycle  
11. Give an account of cyclic endometrial changes with reference to its hormonal control  
(May 2006)
12. Describe the endometrium during the secretory phase of menstrual cycle  
(Sept 2008-2012) (May 2009) Compare between the structure Endometrium of proliferative and secretory phases of menstrual cycle  
(June 2014)
13. Give a detailed account on the structure of placenta with reference to structure correlated to function of the placental barrier  
(May 1999) (May 2012)
14. Describe the microscopic picture of lactating mammary gland (May 2008)/ Describe the structure (LM&EM) and correlated function of Mammary gland alveoli.  
(June 2014)
15. The structure of mammary gland is controlled by pituitary hormone, Discuss  
(September 2006)
16. In a table form, mention 3 structural differences between: Thyroid and lactating mammary gland (May 2011) & Resting and lactating mammary gland (June 2013)

17. Mention the structural differences between Vagina & Oesophagus. (Sep 2012)

18. Assess the value of Highly vascularized lamina propria in vagina. (1m) (Sept 2013)

Chapter 8: The Eye


3. Draw a diagram about corneoscleral junction. (Sep 2007 - May 2000)

4. Give an account on the ciliary body. (May 2006)

5. Discuss the structure of the iris. (Sep 2006)

6. Draw a diagram about layers of the retina. (May 2003)

7. Describe the structure correlated functions of the pigmented epithelium of the retina. (May 2010-2013) (Sept 2014) & Assess the value of: tight junction between pigmented epithelial cells of retina (Sept 2013) & Inner nuclear layer of the retina. (Sept 2012)


9. Give an account on the inner nuclear layer of the cones. (Sept 2007) & Enumerate Types of cells in inner nuclear layer of retina with reference to synaptic junctions. (June 2014)

10. Mention the structural differences between Rod and cone cells [3m] (May 2012)

11. Mention the refractive media of the eye. Describe the major one of them in detail. (May 2011)

Chapter 9: The Ear


2. Discuss the structure of organ of corti. (Sep 2004 - May 2005)


4. Discuss structure correlated to function of:
   a) Eustachian tube. (Sept 2014) b) Semicircular canals. (Sept 2012)

Chapter 10: Nerve Endings and CNS

1. a) Enumerate Different types of non-encapsulated receptors and describe the structure of epidermal receptors. (Sept 2014)
   In a table form, mention 3 structural differences between pacinian & meissner’s
corpuscles (2011) & muscle spindle and golgi tendon organ

2. Give an account on sensation carried by tracts of post. Column of white matter of spinal cord. (Sept 1998)

3. Enumerate the extra pyramidal tract & Discuss in detail the structure of tracts arising from midbrain. (May 1998)

4. Discuss the different lemnisci present in the brain stem (origin, course, termination & function) (Sept 2007) / Describe the origin, course, termination and function of gracile and cuneate tract (June 2014)

5. Describe tracts carrying touch sensation from the body (origin, course, and termination) (Sept 2007)


7. Give an account of the spinocerebellar tracts. (Sept 2001) (2003 Sept) & spino cerebellar tract, with regards to the origin, course, termination & function (4 mark) (May 2012)


9. Discuss the unconscious proprioception. (2000 May)

10. Give an account on the pain pathway. (Sept 2000)

11. Discuss Extraceptivesensation of the face. (May 2002)


14. Give an account of
   a) vestibular nuclei & their connection (2006 Sep) + Clark's nucleus (June 2013)
   b) Different nuclei of vagus nerve with reference to their fibers type.
   c) Different components of inferior olivary nucleus with reference to their connections (Sept 2014)

15. Give an account on Gracile nucleus with regards to the site, afferent & efferent. (Sept 2012)

16. Give an account on contents of basis pontis. (2 marks) (May 2012)

17. Discuss in detail cerebellar connections (Sept 2004) / Enumerate Different fibers of inferior cerebellar peduncles. (June 2014)

18. Give an account on:
   A) The medial longitudinal fasciculus or bundle (MLF). (May 2008)
   B) The main tracts or fibers that make crossing in the medulla. Give origin, course, termination & function of one of them (2008 May) (2011 May)
   C) The mesencephalic nucleus of the 5th trigeminal nerve. (2008 May) (2011 May)
   D) Different nuclei in posterior horn of spinal cord. (June 2014)
19. Mention the origin, pathway, termination and function of:

20. Mention types, structures and connections of:
   a) olivary nuclei   (4 marks)
   b) different cells of the cerebellar cortex  (4 marks) (Sept 2013)

21. **Drawing Questions:**
   1- Draw a label diagram to show the structure of spinal cord at the lower thoracic region.  (May 1999)
   2- Draw & label diagram to show the structure at mid brain level on superior colliculus.  (May 2000)
   3- Mark a labeled diagram of a section of a closed medulla at the level of motor decussation.  (Sept 2000) (May 2010)
   4- Draw and label a diagram to show the structure of the pons at the level of facial colliculus.  (May 2001)
   5- Draw a labeled diagram of the open medulla.  (Sept 2001) (May 2002)
   6- Draw a labeled diagram of the lower part of pons.  (Sept 2003) (Sept 2004)
   7- Draw a labeled diagram of the cerebellar cortex.  (May 2004) (May 2005)
   8- Draw a labeled diagram of superior midbrain.  (May 2006)
   9- Draw labeled diagram of closed medulla at the level of sensory decussation.  (Sept 2006)
   10- Draw a labeled diagram of a section at the level of cervical region of spinal cord.  (Sept 2007) (May 2009)
   11- A section at the superior level of the pons.  (Sept 2007)

**June 2013**

**Illustrate your answers with diagrams:**
1- Describe the structure (LM&EM) and the correlated function of:
   a) Cells lining the intestinal mucosa (5 marks)
   b) Duct system of the parotid gland (4 marks)

2- Describe the structure (LM&EM) and the function of:
   a) Pinealocytes (3 marks)
   b) Chromaffin cells of adrenal medulla (3 marks)
   c) Chief cells of parathyroid gland (3 marks)

3- Compare between the structure of:
   a) Epididymis and Vas deferens (3 marks)
   b) Intrapulmonary and extrapulmonary bronchi (3 marks)
   c) Resting and lactating mammary gland (3 marks)

4- Correlate the structure (LM&EM) to the function of:
   a) Blood renal barrier (3 marks)
   b) Pigmented epithelium of retina (3 marks)

5- Discuss corpus luteum in terms of:
   a) Origin (1 mark)
   b) Structure (1 mark)
   c) Types (1 mark)
   d) Fate (1 mark)
6- Asses the value of:
   a) Tight junctions between the lateral processes of adjacent sertoli cells (1 mark)
   b) Bowman's glands in olfactory mucosa (1 mark)
   c) Apical canaliculi in cells of proximal convoluted tubules (PCT) (1 mark)

7- Discuss the site, connections and function of:
   a) Clark's nucleus (2 marks) 
   b) Vestibular nuclei (3 marks)

**Sept 2013**

Illustrate your answers with diagrams

1. Describe the structure of:
   a) inter alveolar septum (3 marks) 
   b) pancreatic acini (3 marks)

2. Correlate the structure to the function of:
   a) hepatic sinusoids (3 marks) 
   b) parietal cells of stomach (3 marks)
   c) acidophils of anterior pituitary gland (3 marks)

3. Describe the light microscopic structure of proliferative cells of seminefrous tubules (4 marks)

4. Compare between:
   a) proliferative phase and secretory phase of endmetrium (3 marks)
   b) muscle spindle and golgi tendon organ (3 marks)

5. Describe the structure and correlated function of:
   a) proximal convoluted tubules of kidney (3 marks)
   b) Cornea (3 marks) 
   c) Maculae of inner ear (3 marks)

6. Assess the value of:
   a) Highly vascularized lamina propria in vagina (1 mark)
   b) myoid cells around seminefrous tubules (1 mark)
   c) tight junction between pigmented epithelial cells of retina (1 mark)

7. Mention types, structures and connections of:
   a) olivary nuclei (4 marks)
   b) different cells of the cerebellar cortex (4 marks)

**June 2014**

Answer all of the following: Illustrate your answers with diagrams:

1. Correlate structure (LM&EM) to function of:
   a. Parietal cells of Stomach. (3 marks each)
   b. Facet cells (Umbrella-shaped cells) of the urinary bladder.
   c. Pancreatic acinar cells.

2. Describe the structure (LM&EM) and correlated function of: (3 marks each)
   a. Thyroid follicular cells.  
   b. Blood renal barrier.  
   c. Mammary gland alveoli

3. Enumerate:
   a. Different types of dividing germ cells of seminiferous tubules with reference to type of division. (3 Marks)
   b. Types of cells in inner nuclear layer of retina with reference to synaptic junctions. (3 marks)
   c. Different types of lingual papillae and mention their site and function. (2 marks)
4. Compare between the structure of the following items:
   a. Endometrium of proliferative and secretory phases of menstrual cycle. (4 marks)
   b. Muscle spindle and golgi tendon organ. (3 marks)
   c. Acidophils and basophils of pars distalis. (3 marks)

5. Enumerate:
   a. Different nuclei in posterior horn of spinal cord. (2 marks)
   b. Different fibers of inferior cerebellar peduncles. (3 marks)

6- Describe the origin, course, termination and function of gracile and cuneate tract. (4 marks)

Sept 2014

Answer all of the following: Illustrate your answers with diagrams:

1. Correlate structure (LM&EM) to function of: (4 marks each)
   a. Proximal convulated tubular cells.
   b. Sertoli cells of testis.
   c. Pigmented epithelial cells of retina.

2. Enumerate: (4 marks each)
   a. Different types of duct system of parotid gland and describe their structure.
   b. Different types of intestinal epithelial cells and describe the structure of the most numerous one.
   c. Different types of non-encapsulated receptors and describe the structure of epidermal receptors.

3. Describe the histological structure and function of:
   a. Zona fasiculata of suprarenal cortex. (5 marks)
   b. Mature (Graffian) follicle of Ovary. (5 marks)
   c. Eustachian tube. (2 marks)

4. Enumerate: (3 marks each)
   a. Different nuclei of vagus nerve with reference to their fibers type.
   b. Different components of inferior olivary nucleus with reference to their connections.

5. Describe the origin, course, termination and function of Lateral corticospinal tract. (3 marks)

Answers

Oral Cavity

1) Tongue ?- Skeletal Muscle : Bundles + 3 directions
   - Mucous Membrane : Vent. Surface >>> epith: non keratinized
   ** Lip >> Free Red Zone : Transparent
   No sweat or sebaceous glands , No follicles / Dermal Papillae + Highly Vascular
3) Taste Buds?--Supporting -- Taste Receptors -- Basal Cells
1) Esophagus?
- Mucosa >> Epith + L.P + Muscularis Mucosa
- Submucosa >> Esophageal Glands : Lubrication
- Muscularis Ext. >> inner + outer (Mixed)
- Adventitia >>
  No rule in digestion

<table>
<thead>
<tr>
<th>Vagina</th>
<th>Esophagus</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. sq. non kerat.</td>
<td>St. sq. non kerat</td>
</tr>
<tr>
<td>C.T + extensive BVs</td>
<td>C.T</td>
</tr>
<tr>
<td>Inner + Outer</td>
<td>Inner + Outer</td>
</tr>
<tr>
<td>C.T</td>
<td>C.T</td>
</tr>
</tbody>
</table>

2) Mucosa of Fundus?
  Cells in Epith >>> LM + EM / Stem: renewal / Mucous Columnar / secretion
  Mucous Neck: acidic sec. / Peptic: pepsin + Renin + Lipase / Parietal: HCL + intrinsic factor / Enteroendocrine: .......

3) Parietal cells?
LM / EM - intercellular canaliculi >>> function / mitrocellular //////////>>> function / Mitochondria + Golgi

4)

<table>
<thead>
<tr>
<th>Pyloric Gland</th>
<th>Fundic Gland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide long . Half of mucosa</td>
<td>Narrow ½ mucosa</td>
</tr>
<tr>
<td>Branched . colied</td>
<td>Narrow . straight</td>
</tr>
<tr>
<td>Half of mucosa</td>
<td>Whole thickness of mucosa</td>
</tr>
<tr>
<td>Parietal</td>
<td>Mucous neck Peptic</td>
</tr>
</tbody>
</table>

5) Villi? - C.T / Lacteals >> fat absorption / Smooth muscle fibers >> movement / plasma + macrophage / - Arterial Twigs >> transport absorbed food
6) Cells in Villi + Crypts?
Villi >> (GEME) .... goblet + enteroendocrine + M cell + Enterocyte
Crypt >> (GEME E + B + P) ....... Basal + Paneth
** Paneth cells: Secret Lysozyme / Secrete antimicrobial peptides

7) Mucosa of ilium?
* No Villi ... NO Paneth .... More Goblet / epith: simple columnar ..... goblet ..... stem ..... enteroendocrine / L.P: Crypts + NO Paneth / Muscularis : inner + outer
9) Large Intestine? Cecum - Appendix - Colon - Rectum + Anal Canal
10) Goblet cell? Its mucous secretion lubricate hard food after absorption of water
11) Recto-anal Junction?
-Crypt >>> disappear - pith >>> st. sq. kerat . & non - scularis Mucosa >>> disappear - mucosa >>> Veins ...... (Piles) - er circular >>> thicker .... internal sphincter - er circular >>> disappear
12) Appendix | Large Intestine
---|---
Less Goblet | No villi + more goblet
C.T + very short crypt | C.T + No Paneth + Crypts
Ill defined | Inner + Outer
C.T + premanent Lymphatic nodules | C.T
Inner + outer + No taenia Coli | Inner + Outer (taenia Coli)
C.T Very narrow lumen | C.T + Appendices Epiplicae

13) secret mucous : Goblet cell / Surface epithelial / Mucous neck cell

14) Mucous columnar cell / Mucous neck cell / Peptic / Parietal / Enteroendocrine

Absorption: enterocyte

**Gut association glands**

1) Acini ?*Serous >>>secrete watery saliva rich in amylase / *Mucous>>>secrete mucous secretion for lubrication / page 60
2) Parotid Gland?
   *2 S (Serous acini + Striated duct) / *2 Thick (thick capsule + thick septa)
   *25% of total saliva
3) Myoepithelial cell:
   - Its process contract >> press on acini >> release secretory enzymes into the duct
   - Prevent overdistention of acini during secretion
4) Pancreas?
   *STROMA: C.T / *Pranchyma: Acini >>> serous & Duct portion
5) Islets of langerhans? - Endocrine portion of pancreas >>> (great numb. in tail of pancreas) - LM: scattered pale staining clusters of cells + reticular fibers **(A & B &D)
6) Exocrine part of pancreas:
   - centroacinar cells >> cuboidal .. flat esq. / - intercalated >>> cuboidal >>> into interlobular / - interlobular >> low columnar / - Main pancreatic duct >>> simple columnar + common bile duct into duodenum
   *** The difference between parotid:
   centroacinar >>> in pancreas .... not in parotid
   striated >>> not in pancreas ...... in parotid
   main duct >>> columnar in pancreas .... st. columnar + st. sq. in parotid
7) Classic hepatic lobules?
   - Hexagonal or pentagonal mass of liver + Central vein
   - Branching plates of hepatocytes separated by sinusoidal blood capillaries
   - Space of Disse between hepatocytes and sinusoidal endothelium
   - Portal tract on its corner (4 structure) >>> show endocrine function
   *** Hepatocyte : LM: ....... (acidophilic) / EM: cytoplasm contain ............... + 3 surfaces / Function:
8) Portal lobule? - Triangular ..... 3 adjacent hepatic lobules ... portal tract ..... central veins at its angels-direction of bile
8) Liver acinus?
   - Diamond.... 2 portal tract . 2 nearest central veins ... 2 adjacent lobules
   - Blood supply + 3 zones

120
9) Blood sinusoids? *Fenestrated endothelial cells
* Kupffer cells >>>> phagocytosis + breakdown RBCs
9) Space of Disse?
* Plasma * Non myelinated nerve fibers
* Microvilli * Pit cells
* collagen 3 * Ito cells >>> exchange between blood & hepatocytes

Endocrine
1) Chromophobes: 50% of pars distalis / smaller than chromophilis + LM
* Chromophilis: 50% / larger than chromophobes / specific granules
** Hypothalamic regulation >> Tuberohypophyseal Neurons ......
** Blood Supply: Sup Hypophyseal art. + .......
2) Regulation of milk production: (Mamotrophes in pars distalis)
Tuberohypophyseal neurons
* Regulation of milk ejection: (Herring bodies in pars nervosa)
hypothalamo-hypophyseal tract
3) Milk production: Mamotrophes LM / EM: / Milk secretion: Herring bodies in pars nervosa
4) Structure of mammary gland controlled by pituitary hormones?
* Structure in Resting state / * Pituitary >> prolactin & oxytosin
* Structure in lactating state / * Effect of each hormone: prolactin, estrogen & oxytosin
* Myoepithelial cells around alvoli > by oxytocin
5) Somatotrophes >> in pars distalis close to blood capillaries
6) Somatotrophes? - LM: EM:- Function:
7) Pars nervosa? (PRFHH) - Pituicytes - Reticular fibers - Fenestrated capillaries
-Herring bodies - Hypothalamo-hypophyseal tracts
** relation to hypothalamus: hypothalamo-hypophyseal tracts
8) Page 26-27

- Function: glucocorticoids
10) Adrenal Medulla? - Chromaffine cells-ganglion cell
12) Regulation of Ca level in blood? Parathyroid gland >> chief cell & oxiphil cell
13) Follicular cell? LM: Normal & Hyperactive & Hypoactive
EM: rER, Golgi, mitocondria / Function: thyroid hormones
14) Thyroid
Mamm. Gland
cells
lumen filled with
homogenous
arrangement
secretion
15) Pineal body? - Pinealocytes + discuss-Neuroglial cell + discuss

Urinary
1) Renal Corpuscle?
* Bowman's capsule >>> External & Internal (Podocytes) & their Function
* Glomerulus >>>> Glomerular capillaries & Mesangium & their function
2) Podocyte? M:
   Function: + 3 layers of blood renal Barrier
3) Glomerular filtration barrier? (3) * endoth. of capillaries + its function
   * basement membrane + its function
   * filtration slits of podocyte + its function
4) Mesangial Cells?
   * Intraglomerular >>>> LM + EM + Function (SBC + MM + RR)
   Support + basement membrane + chemical mediators + Macrophage + Matrix + Receptor
   for 2
5) Extraglomerular (Lacis) >>>> Juxta.glomerular apparatus
6) Convoluted tubules?
   LM: type of epith. + num of cells + acidophilic cytoplasm + basal striation + Nucleus
   EM: brush border + interdigitation + Mitochondria + pinocytotic vesicles
   - - - - - - - - - - - compare between DCT & PCT page 51
7) Loop of Henle? * Long & Short * (4 Portions / Function
8) Juxta-glomerular apparatus?
   * Macula Densa * Lacis cells * Juxtaglomerular cells + Discuss each one
9) Macula Densa has no basement membrane? To be in a direct contact with
   Juxtaglomerular cells and lacis cells
10) Blood supply of the kidney?
    Renal art > interlobar > arcuate > interlobular > aff > capillaries > eff > peritubular
    capillaries > interlobular V > arcuate V. > interlobar V. > Renal V.
11) Urinary Bladder?
    * Mucosa: Transitional epith. + Advititia: C.T
    * Muscosa: Sm. muscle run in every direction (IL + MC + OL)
    * Ureter
    * VAS Deferens
    * pseudo.st.column + stereocilia
    * Advintitia:
      * C.T
12) Male Urethra?
    * Prostatic * Membranous * Penile + Discuss each one
6) Male
1) Seminiferous tubules? * Spermatogenic cells * Sertoli cell
   _ surrounded by basement membrane
   _ enclosed by 2 layers of myoid cells >> movement of spermatozoa
2) Spermatogenic cells? * Spermatogonia: Dark A & Pale A & B
   * Primary spermatocyte * Secondary spermatocyte
   * Spermatids + Discuss each one
3) Spermatogenesis? * Spermatogenesis >>>> Proliferation & Growth & Maturation
   * Spermiogenesis >>>> Golgi & Cap & Acrosomal & Maturation
4) Primary spermatocyte? * Origin
   * Structure
   * Course
5) >>>>>>>>>>> (2)
6) adluminal part? Pry. & sec. spermatocytes & Spermatids
7) Spermiogenesis? *Golgi * Cap * Acrosomal * Maturation
8) Cells forming barrier? Tight junction of adjacent Sertoli cells
9) Blood testis barrier? * Junction between sertoli cells + 2 compartments/Function
10) Lydig? - secrete testosterone .......... 
11) Male urethra? * Prostatic * Membranous* Penile + Discuss each one
12) Ureter VAS Deferens
   * Mucosa : epith  * Transitional epith.
   * pseudo.st. column + sterochilia
   * Musclosa : * Upp.2/3 (IL+OC) *( IL + MC + OL)
   * Low.1/3 (IL+MG+OL)
   * Advintitia:
     * C.T  
     * C. T
13) Extra-testicular ducts?
   * Epididymis * Vas * Ejaculatory duct * spermatic cord + Epith . + Function
14) Pathway of mature sperms?
   * Testis >> Tubuli Recti >> Rete testis >> Vasa efferentia >> Epididymis >> Vas >> Ejaculatory duct >> Prostate urethra >> Mem. >> Penile urethra + Epith of each
15) Hydrolytic enzymes?
   * Structure: Hyaluronidase & neuraminidase & acid phosphatase & Protease
   * Function: Facilitate penetration ........
16) Accessory glands? * Seminal vesicle * Prostate gland * Cowper's glands
17) Prostate gland? * Stroma: Capsule & Septa
   * Pr anchyma: Mucosal & Submucosal & Main acini * Function: ........

Female

1) Oogenesis? * Proliferation * Growth * Maturation + Discuss each one
2) Mature graffian follicle? * Theca folliculi: theca interna & externa
   * Follicular cavity: .................. * Follicular cells: Membrana granulosa ........ & cumulus oophorous .................. & corona radiata ..................
3) Corpus Luteum? * Origin: after ovulation, granulosa cells & theca interna * Structure:
   granulosa cell >> granulosa lutein + (LM , EM) theca interna >> theca lutein +
   (LM , EM) + 3 Types
   * Fate: Corpus albicans
   - ve/ EM: granules (200-400nm) Function: FSH + & LH ....
5) Growing follicles? * Primordial * Primary >> Unilaminar & multilaminar * Secondary
   * Mature graffian follicle + Discuss each other
6) Ovarian structures involved in ovulation?
   * Stages >> Mature Graffian follicle >> Ovulation >> sec. oocyte >> after ovulation: corpus luteum .................
7) Cortex of the ovary during luteal phase?
   _ LH increases blood flow to the ovary >> edema and increase in intrafollicular fluid
   >> increase in intrafollicular pressure
   _ The corpus luteum is formed >> secrete estrogen & Progesterone
8) Fallopian Tube? * Mucosa : Epith >> Peg cell & ciliated columnar cell/ L.P >> C.T
   * Muscle layer: IC & OL * Serosa: C. T + Function
   + Cyclic changes in it under the effect of: _ Estrogen / After Ovulation
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>9) &gt;&gt;&gt;&gt;&gt;&gt; (8)</td>
<td>Cyclic changes in endometrium?*Menstrual phase:.....*Proliferative:.............*Secretory: Early period &amp; Ischemic period:..............</td>
</tr>
<tr>
<td>10)</td>
<td>Placenta?*Fetal part: Chorionic villi &gt;&gt;&gt; cyto-trophoblast &amp; syncytiotrophoblast *Maternal part: Decidua basalis...........--Palcental barrier &gt;&gt;&gt; 6 layers:.............</td>
</tr>
<tr>
<td>11)</td>
<td>Lactating Mammary gland?*Stroma: thin septa + lobes + lobules &amp; No fat *Pranchyma: Secretory alvoli:.........../Duct system:..............</td>
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</tbody>
</table>

**Eye**

1) Layers of the cornea?*Corneal epith.* Bowman's mem. (Struc. + Func.) *Substantia propria (3 struc.)* Descement's mem. *Descement's endoth. (EM)-- Its transparency:*Avascular *Regular arrangement *Same refractive index of all components *withdrawal fluida from stroma --Microvilli: retaining film of tears to keep the cornea weet

4) Ciliary Body?*3 surfaces* 2 Zones*Struc: *C.T *
* 2 layers of cuboidal cells>>> outer + inner

5) Iris? *(A V D E)* Ant. surface*Vessel layer*Dilator pupillae muscle *
*Epith. + Discuss each one

7) Pigmented epith of retina?

Inner nuclear layer of retina?*Bipolar *Horizontal*Amacrine *Muller

8) Rods?*Outer segment : LM & EM *
*Inner segment : Outer & Inner portion*Cell body:............

9) Inner nuclear layer of cones?*

10) Rods
*Rod in shape
*Membrane disks & Membrane
*Rhodopsin
*Conical
*Continuous with it
*Continuous with it

Cones
*Conical
*Continuous with it
*Continuous with it

11) Refractive media of the eye?*Cornea >> Major one
*Aqueous humor *Lens *Vitreous body

12) Lactating Mammary gland?
*Stroma: thin septa + lobes + lobules & No fat
*Pranchyma: Secretory alvoli:.........../Duct system:..............
Ear
1) Crista Ampullaris? *Hair cells: Type 1 & 2 *Supporting cells
-- Hair cells do not rest on the basal lamina-- glycoprotein >> cupula not otolith
* Function: angular acceleration ..............
2) Organ of corti? *Hair cells >> Inner & Outer (+ differences)
* Supporting >> Inner & Outer pillar, Inner & Outer Phalangeal, Border, Hensen & Claudius
3) Semicircular canals? *3 canals
* 5 openings
* Rec: crista ampullaris + structure + function

Free Nerve Endings & CNS
1) Pacinian corpuscle? *Sites: ............
* Struc.: myelinated >> loses sheath (first Ranvier) >> opp. Pole
- Schwann cells >> inner .......... & Outer ........
Meissner's? *Site: * Struc.: perpendicular >> thin capsule >> flattened schwann cell
- aff. run in spiral course >> branches
Muscle spindle? *Site: ..................... * Struc.: parallel, C.T capsule
- 2-12 intrafusal muscle fibers >> Nuclear bag & Nuclear chain: Aff. & Eff, innervation
2) Post column of white matter?
** Gracile & Cuneate >> Fine touch + proprioception *First order >> *Sec. order
>> *Third order >>
3) Extra-pyramidal tracts? *Rubro-spinal
* Vestibulo-spinal
* Tecto-spinal
* Medullary & Pontine* MLB
4) Different Lemisci? *Spinal >> Vent & lat spino-thalamic
* Medial >> Gracile & Cuneate
5) Touch sensation?
* Fine >> dorsal column: gracile & cuneate
* Crude >> Vent. spino-thalamic
6) Corticospinal tract? *Origin: cortex ............
* Pathway: corona radiata >>> internal capsule: - in Mid brain: .... - in Pons: - in medulla:
>>> Lat & Vent & anterolateral
7) Spinocerebellar?
* Dorsal
* Ventral
* Origin
* Clark's
* Termination
* ICP
* Crossing
* Uncrossed
* Function
* Infor. individual limb muscle

8) Conscious proprioception?
* Gracile & Cuneate ..............
9) Unconscious proprioception? *C1-C7 >> cuneo-cerebellar
* C8-L3 >> Clark's >> dorsal spinocerebellar * Below L3 >> either gracile till Clark's
* Lumber, sacral, coccyreal >> ventral spinocerebellar
10) Pain pathway? * Fast Pain >> Lat spinothalamic First & Second & Third order neuron

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11) Extraseptive sensation of the face?
12) Auditory pathway?
   * 1st order neuron: receptor >> spiral ganglion >> vestib. nerve >> Dorsal & vent. cochlear nuclei
   * 2nd order neuron:.......................... 3rd order neuron:..........................
13) Sensory nuclei of trigeminal?
   * Main sensory nucleus >> Touch
   * Mesencephalic nucleus >> Propioception + Connection of each one
14) Vestibular nuclei & connection?
   * Site: *Nuclear grp: *Connection:
     - Cerebellum............ - Spinal cord........... - MLB..........
15) Gracile nucleus?
   * Site: closed medulla
   * Aff: fibers carrying fine touch + proprioception
   * Eff: sensory decussation > medial leminiscus
16) Contents of basis pontis?
   * Longitudinal fibers
   * Transverse fibers
   * Pontine nuclei
17) Cerebellar connection?
   * Aff: Climbing & Mossy
   * Eff: from deep cerebellar nuclei
     - connection of deep cerebellar nuclei >> corticonuclear & Nucleocortical extracerebellar inputs/SCP/IP
18) MLB?
   * Definition: *Position: *Structure: *Connection: Ascending & Descending
   * Function:
     Crossing in medulla
     * Motor decussation
     * Sensory decussation
     * Mesencephalic nucleus of trigeminal?
     * Propioceptive sensation of the face + its connection
19) Lat. spinothalamic tract?
   * Origin: lamina 1, 4, 5
   * Pathway: 1st, 2nd, 3rd order neuron
   * Termination: *Function: fast pain & Temperature
   * Media leminiscus?
     * Origin: gracile & cuneate tract > nucleus in medulla
     * Pathway: lemisci in brain stem > internal capsule > corona radiata > cortex
     * Termination: cortex
     * Function: fine touch & proprioception

**June 2013**

1- a) page 34 in part 1 book / b) page 60 (the duct portion)
2- a) page 29 in part 2 book  b) page 27  c) page 21
3- a) page 87, 88 in part 2 book  b) page 238, 244 in first year book
   c) page 123, 124 in part 2 book
4- a) page 41 in part 2 book b) page 10 in part 3 book
5- page 108 in part 2 book
6- a) Protect the developing sperms from the immunological attack
    b) their secretion allow perception of new odorous substances
    c) to absorb macromolecules
7- a) page 58 in part 3 book (number 5) / dorsal spinocerebellar tract in page 64
    b) page 101 and 102 in part 3 book
1. **Methods of learning:**
   a- imitation
   b- Trial & error
   c- Insight learning
   d- all of the above

2. **Function of the right hemisphere:**
   a- language
   b- global thinking
   c- simple calculation
   d- all of the above

3. **Functions of the limbic lobe:**
   a- emotions
   b- motivation
   c- memory
   d- all of the above

4. **Function of the reticular activating system:**
   a- sleep-wake cycle
   b- attention
   c- control level of arousal
   d- all of the above

5. **Autonomic movement is:**
   a- Agitation
   b- relaxation of the triceps during biceps muscle contraction
   c- hand movement while walking
   d- all of the above

6. **Function of the parietal lobe:**
   a- management of the body
   b- knowledge of the numbers and their relations
   c- visual association
   d- auditory association

7. **Function of temporal lobe:**
   a- somatic sensation
   b- visual sensation
   c- comprehensive speech
   d- none of the above

8. **Core communication skills include:**
   a- information gathering skills
   b- information giving skills
   c- all of the above
   d- doctor patient interpersonal skills

9. **Mature defensive mechanisms include all of the following except:**
   a- sublimation
   b- altruism
   c- suppression
   d- repression

10. **The following are known characteristics of REM sleep except:**
    a- rapid eye movement
    b- desynchronized EEG activity
    c- penile nocturnal tumescence
    d- increased muscle tone

11. **The importance of effective doctor-patient communication are:**
    a- accurate diagnosis
    b- enhancing patient compliance to treatment plan
    c- patient satisfaction
    d- all of the above

12. **The direct coping with illness is:**
    a- problem focused
    b- emotional focused
    c- denial
    d- none of the above

13. **Medical students need to acquire the following skills:**
    a- information skills
    b- psychoanalysis
    c- hypnosis
    d- none of the above

14. **Fields of psychology includes:**
    a- developmental psychology
    b- experimental psychology
    c- social psychology
    d- forensic psychology
    e- all of the above
15. Perception depends on:
   a-selectivity   b-expectation
   c-organization   d-all of the above

16. Factors affecting perception:
   a-cognition   b-compliance
   c-emotional state   d-none of the above

17. Imaginative thinking is:
   a-uncontrolled   b-not goal directed
   c-sometimes unrealistic   d-all of the above

18. Examples of imaginative thinking:
   a-creation   b-scientific innovation
   c-day dreams   d-problem solving

19. Function of language is:
   a-learning   b-interpersonal communication
   c-thinking   d-all of the above

20. Environmental determinants of aggression include:
   a-air pollution   b-noise
   c-crowding   d-all of the above

21. Chromosomal aberration leads to aggression is:
   a-XXX   b-XX
   c-XYY   d-all of the above

22. Basic psychology include:
   a-forensic psychology   b-experimental psychology
   c-commercial psychology   d-sport psychology

23. Parameters of development include:
   a-physical development   b-cognitive development
   c-psychosocial development   d-all of the above

24. The IQ average intelligence ranges:
   a-less than 60   b-90-110
   c-130-140   d-more than 130

25. Factors affecting intelligence include:
   a-personality   b-frustration
   c-heredity and environmental factors   d-all of the above

26. The state of arrested development of mind is:
   a-delirium   b-mental retardation
   c-delusion   d-apathy

27. Freud view personality is composed of:
   a-ID, ego, superego   b-extraversion, neuroticism and impulsivity
   c-introversion and psychoticism   d-16 basic factors

28. Characteristics of schizoid personality include:
   a-shy   b-introverted
   c-withdrawn   d-all of the above

29. Characteristics of paranoid personality disorder include the following except:
   a-Repeated lying   b-Suspiciousness.
   c-Oversensitive   d-Excessive self importance with inability to accept criticism.

30. Motivation:
   a-Is the force that directs the behavior towards a goal.
   b-Leads to illusion.
   c-Include expression and experience components.
   d-None of the above.
31. Which of the following fields of psychology has vocational (job) goals:
   a-Industrial psychology.  
   b-Counseling psychology. 
   c-Forensic psychology.  
   d-A+B.  
   e-A+B+C. 

32. Inter-group conflicts are studied through:
   a-Clinical psychology.  
   b-Social psychology.  
   c-Forensic psychology.  
   d-Experimental psychology.  
   e-Educational psychology. 

33. Clinical psychology apply psychological principles to diagnosis and treatment of:
   a-Criminal behavior.  
   b-Mental retardation.  
   c-Juvenile delinquency.  
   d-Drug addiction.  
   e-All of the above. 

34. Which of the following personality disorders is characterized by exhibitionism:
   a-Histrionic P.D  
   b-Avoidant P.D  
   c-Borderline P.D  
   d-Narcissistic P.D  
   e-Compulsive P.D 

35. Passive aggression P.D is characterized by:
   a-Resistance for adequate performance both socially and occupationally.  
   b-Dependant and lack of self confidence.  
   c-Stubbornness as passive resistant behavior.  
   d-Resistance is expressed indirectly instead of inefficiency  
   e-All of the above. 

36. Personality traits of personality disorders are characterized by:
   a-Inflexible.  
   b-Maladaptive.  
   c-Significant impairment of social or occupational functioning.  
   d-Subjective stress.  
   e-All of the above. 

37. Dramatic personality disorders include:
   a-Histrionic P.D  
   b-Narcissistic P.D  
   c-Antisocial P.D  
   d-Borderline P.D  
   e-All of the above. 

38. Which of the following personality disorders may have substance abuse problem:
   a-Antisocial P.D  
   b-Borderline P.D  
   c-Compulsive P.D  
   d-A+B.  
   e-A+B+C. 

39. Personality disorder with lack of self confidence (low self esteem) include:
   a-Passive aggressive P.D  
   b-Avoidant P.D  
   c-Narcissistic P.D  
   d-A+B.  
   e-A+B+C. 

40. Perfectionism is criteria of which of the following personality disorders:
   a-Compulsive P.D  
   b-Histrionic P.D  
   c-Antisocial P.D  
   d-Schizoid P.D  
   e-None of the above. 

41. Which of the following disturbances of emotion is associated with guilt feelings:
   a-Anxiety  
   b-Depression  
   c-Euphoria  
   d-Elation  
   e-Grief 

42. Schizophrenia may be associated with emotional disturbances as:
   a-Euphoria  
   b-exaltation  
   c-depersonalization  
   d-Ecstasy  
   e-all of the above 

43. If a patient has intact emotion experience without reflection of emotional expression, he said to be:
   a-Apathetic  
   b-blunted  
   c-indifference  
   d-euphoric  
   e-incongruent
44. Anhedonia which occurs in some psychiatric disorders means:
   a-Loss of pleasure   b-Apprehension
   c-Subjective feeling of well-being   d-Unpleasant subjective awareness
   e-Sense of enjoyment and self confidence radiating to the others

45. Psychoanalytic concept of motivation (Freud) includes:
   a-Instinct model (Eron & Thanatos)   b-Conscious & unconscious model
   c-repression model   d-complex model
   e-all of the above

46. Vicarious learning in social learning theory of motivation means:
   a-thinking and representing situations symbolically
   b-Learning by observation
   c-our actions are governed by anticipated consequences
   d-Self regulatory processes (internal reinforcement)
   e-all of the above

47. Unconscious motives according to Freud theory can be expressed in:
   a-Dreams   b-Slips of speech
   c-Symptoms of mental illness   d-A+B   e-A+B+C

48. Cause(s) of hallucinations includes:
   a-schizophrenia   b-organic brain disease
   c-physiological before we fall asleep   d-sensory deprivation
   e-all of the above

49. Micropsia is one of the:
   a-perceptual loss   b-perceptual deception
   c-perceptual distortion   d-A+B   e-A+B+C

50. Borderline I.Q.:
   a-I.Q. ranges between 70 – 79   b-represent 5% of normal distribution of bell curve
   c-considered superior I.Q.   d-A+B   e-A+B+C

51. In operant conditioning:
   a-involves cranio-spinal nervous system   b-stimulus determines the behavior
   c-the animal is passive   d-response depend on the stimulus
   e-responses are involuntary

52. Organic amnesia:
   a-may occur due to transient ischemic cerebral attacks (TICA)
   b-may occur due to head injuries
   c-characterized by anterograde or retrograde amnesia
   d-dementia is considered a subtype
   e-All of the above

53. Confabulation:
   a-is a type of paramnesia
   b-completely false description of past events
   c-unconscious feeling of gaps in memory
   d-usually associated with organic pathology ( organic brain syndrome )
   e-all of the above

54. Dissociated or hysterical amnesia :
   a-there is a loss memory & identity
   b-personality remains intact
   c-often accompanied by fugue state & usually circumscribed
   d-related to conflicting situations
   e-all of the above
55. Delusion in manic patients include:
   a-Delusion of references  b-Delusion of grandiosity
   c-persecutory delusions  d-Delusion of infidelity
   e-Delusion of nihilism

56. Disorders of form of thinking include:
   a-thought broadcasting  b-bizarre delusions
   c-lack of association & incoherent thinking  d-thought block
   e-overvalued ideas

57. Delusion of Hypochondriasis means:
   a-delusion concerning body function
   b-patient believe that he has serious illness
   c-patient believe that part of all his body does not exists
   d-strange false belief (invaders from the space implant electrode inside his brain)
   e-patient believe that his partner is unfaithful

58. Disorders of the content of thinking include:
   a-preoccupation with obsessions  b-overvalued ideas
   c-delusions  d-A+B  e-A+B+C

59. Persecutory delusions mean:
   a-patient believes that he is being harassed or cheated
   b-patient believes that his partner is unfaithful
   c-patient believes that others refers to him
   d-patient believes that invaders from the space implant electrodes inside his brain
   e-patient believes that he is important & powerful

60. Delusions in schizophrenic patients includes:
   a-Delusion of references  b-Delusion of grandiosity
   c-persecutory delusions  d-Delusion of infidelity
   e-all of the above

61. Delta waves in EEG seen more in:
   a-stage I of NREEM sleep  b-stage II of NREEM sleep
   c-stage III of NREEM sleep  d-stage IV of NREEM sleep
   e-during REM sleep

62. Which of the following concerning functions of REM sleep is/are true:
   a-memory consolidation takes place  b-catecholamines are synthesized
   c-it prevent lethargy  d-A+B  e-A+B+C

63. Following are characteristics of REM sleep except:
   a-Increased parasympathetic activity.
   b-Increased sympathetic activity.
   c-EOG (electro ocuulogram) shows rapid eye movement.
   d-All of the above.

64. Normal intelligence, IQ ranges from:
   a-↓60  b-80-89  c-90-110  d-↑130

65. Characteristics of paranoid personality disorder include the following except:
   a-Repeated lying  b-Suspiciousness
   c-Restricted emotions  d-Inability to accept criticism

66. Disorders of thinking include:
   a-Delusion  b-Hallucination
   c-illusion  d-All of the above

67. Disorders of memory include all of the following except:
   a-Amnesia  b-Paramnesia
   c-Confabulation  d-Apathy
68. All of the following are functions of temporal lobe except:
   a-Audition  
   b-Emotion
   c-Memory.  
   d-Thinking.

69. According to operant conditioning:
   a-The behavior followed by a reward will be repeated.
   b-The behavior followed by noxious consequences will be repeated.
   c-Reinforcement is associated with apparent conditioning.
   d-All of the above.

70. The area of the brain involved aggression is:
   a-Hypothalamus.  
   b- Amygdala.
   c-Cerebral cortex.  
   d-All of the following.

71. Hallucination is:
   a-Sensory perception without stimulus.
   b-May be auditory, visual or tactile.
   c-All of the above.
   d-None of the above.

72. Euphoria is:
   a-Subjective feeling of well being and confidence
   b-Happiness.
   c-Unconcerned of his physical or mental illness
   d-All of the above.

73. Defense mechanisms are:
   a-Only used by persons with neurosis  
   b-Conscious mechanism
   c-Important to deal with frustration 
   d-All of the above.

74. Psychology has a direct relation to medicine in the following areas except:
   a-Behavioral manifestation of medical illness.
   b-Understanding doctor-patient relations
   c-Patient’s response and coping to illness and treatment
   d-Laboratory and radiological

75. All of the following are stages of cognitive development describe by piaget except:
   a-Sensory-motor stage  
   b-Preoperational stage
   c-Oral stage  
   d-Concrete operational stage

76. Theories of interpersonal attraction include:
   a-Reinforcement model  
   b-Social exchange model
   c-All of the above  
   d-None of the above

77. Compliance of patients may be improved by:
   a-Rejecting and unfriendly doctor  
   b-Complex treatment
   c-Verbal instruction given to the patient  
   d-Good doctor-patient relationship

78. An introvert person is:
   a-Sociable  
   b-Seeks company of others
   c-Always shy and works alone  
   d-Can talk in public

79. Psychology is defined as:
   a-the study of mind and behavior  
   b-the study of mind
   c-the scientific study of behavior  
   d-the scientific study of mind and behavior

80. The following are known functions of REM sleep except:
   a-catecholamine synthesis  
   b-memory consolidation
   c-restoration of body functions after fatigue  
   d-dreaming
81. The following is true about profile of sleep in infants:
   a-REM represents 20% of total sleep    b-total sleep time is the same as in adults
   c-no changes in sleep with age    d-none of the above
82. Psychology has a direct relation to medicine in the following areas. Except:
   a-behavioral manifestation of medical illness
   b-understanding doctor-patient relationship
   c-patient response and coping with illness & treatment
   d-laboratory & radiological
83. The direct coping with illness is:
   a-problem focused    b-emotional focused
   c-denial    d-none of the above
84. Medical students need to acquire the following skills:
   a-information gathering skills
   b-psychoanalysis
   c-hypnosis
   d-none of the above
85. Types of attention including all the following. Except:
   a-voluntary
   b-motivation
   c-involuntary
   d-spontaneous
86. The following factors make the person more attentive to certain objects. Except:
   a-a steady stimulus
   b-motivation
   c-expectation
   d-threatening stimuli
87. Cognitive process by which sensory stimuli are translated into meaningful information is:
   a-attention
   b-thinking
   c-perception
   d-memory
88. Disorders of memory include all the following except:
   a-Amnesia
   b-Hypemnesia
   c-Illusion
   d-Confabulation
89. Concept formation is a method of:
   a-Attention
   b-Thinking
   c-Memory
   d-Perception
90. Examples of imaginative thinking include:
   a-Creation
   b-Scientific innovation
   c-Day dreaming
   d-Problem solving
91. Alarm reaction (physiological response to stress) includes:
   a-Increase heart rate
   b-Decrease heart rate
   c-Decrease blood pressure
   d-Muscle relaxation
92. Environmental determination of aggression include:
   a-Air pollution
   b-Noise
   c-Crowding
   d-All of the above
93. Social determinants of aggression include:
   a-Relaxation
   b-Frustration
   c-Social skills
   d-All of the above
94. The chromosomal aberration that may lead to aggression is:
   a-XXX
   b-XX
   c-XYY
   d-All of the above
95. Basic psychology include:
   a-Forensic psychology
   b-Experimental psychology
   c-Commercial psychology
   d-Sport psychology
Developmental psychology is a branch of psychology concerned with:

a-Factors that shape behavior from birth to old age  
b-Social relation  
c-Frustration  
d-Aggression  

**MCQ June 2013**

**Select the most correct answer:**

1. All the following are factors affecting bystander intervention EXCEPT:
   a) the risk of physical injury  
b) the fear of legal consequences  
c) the diffusion of responsibility  
d) the reciprocal liking  

2. Types of coping strategies used in the stress management techniques are:
   a) information seeking type  
b) emotion focused type  
c) behavioural type  
d) all of the above  

3. The barriers of communication includes all of the following EXCEPT:
   a) syntax and language barrier  
b) environmental barrier  
c) proper body language  
d) emotional barrier  

4. Antisocial personality disorder is characterized by:
   a) being emotionally callous and impulsive  
b) grandiosity  
c) seduction and attention seeking  
d) dishonour  

5. Core communication skills in an effective doctor-patient relationship are:
   a) information gathering and information giving skills  
b) doctor-patient interpersonal skills  
c) both a and b  
d) neither a nor b  

6. Perception differs from sensation in:
   a) being controlled by the primary cortical area  
b) it is the interpretation, giving meaning and recognition of a sensory input  
c) the role of the brain is passive in perception  
d) it depends on physiological basis  

7. The ego functions for:
   a) pleasure seeking  
b) inhibiting the personality to sustain the morals and social values  
c) dealing rationally with the requirements of the reality  
d) immediate gratification  

8. Knowing the attitude of the people is useful in the following:
   a) it can predict their behavior  
b) it indicates their beliefs  
c) both a and b  
d) neither a nor b  

9. The following is true about psychological approaches:
   a) the cognitive approach explains how the behavior is determined by processing of information  
b) the biological approach explains how the behavior is controlled by external stimuli of the environment  
c) the psychoanalytical approach explains how the behavior is related to biological change  
d) the behavior approach explains how the behavior is controlled by unconscious motivation  

10. Narcissistic personality disorder is characterized by:
    a) empathy  
b) grandiosity and need for admiration  
c) sense of insecurity  
d) rigidity
11. The following is true about emotions:
   a) the limbic system is responsible for apprising the danger and the emotion
   b) it has both affective and cognitive components
   c) the autonomic system is responsible for the subjective experience of feeling
   d) they don’t enhance creativity or productivity

12. Psychological approaches in treatment of physical illness include all the following except:
   a) information provision
   b) not allowing the patient to talk about his worries
   c) modeling
   d) skill training intervention

13. Personal factors that increase perception are:
   a) proximity of stimulus
   b) symmetry of stimulus
   c) past experience
   d) perceiving incomplete figures as whole

14. What is true about types of attention:
   a) habitual attention is like an engineer looking at a machine
   b) voluntary attention is like a reflex response to a flash light
   c) involuntary attention is like listening to an interesting story
   d) spontaneous attention is like listening to a lecture

15. Information giving skills in a good doctor-patient relationship is in the following:
   a) not allowing the patient to ask questions to understand his illness
   b) silence of doctor during whole interview
   c) they are communication skills aiming to decrease patient compliance to treatment
   d) using clear and easy language while explaining the illness to the patient

16. All the following about stereotypes are true except:
   a) they are defined as perceptions and beliefs a person has about members of some groups
   b) they lead to prejudice
   c) they are a form of social relation
   d) they involve a false assumption that all members of a group share the same characteristics

17. Methods of learning are the following:
   a) trial and error
   b) operant and classical conditioning
   c) imitation and modeling
   d) all of the above

18. Psychological responses of dying patients include:
   a) denial
   b) rage and anger
   c) bargaining
   d) all of the above

19. Neurotic defensive mechanism include one of the following:
   a) reaction formation
   b) denial
   c) humor
   d) altruism

20. Characteristics of short term memory include all the following except:
   a) this type of memory depend on attention
   b) it takes seconds to minutes in duration
   c) retrieval of stored memory is aided by cues
   d) memory storage occurs through structural changes within the synapse

21. Considering operant conditioning of a learned behavior, one of the following is true:
   a) the response is involuntary
   b) it is established by Pavlov
   c) behavior is repeated if followed by a reward and eliminated if followed by noxious stimuli
   d) there is pairing of conditioned and non-conditioned stimuli
22. Environmental determinants of aggression are:
   a) air pollution and heat above 32°C  
   b) lack of social skills  
   c) chromosomal aberrations  
   d) pain and anxiety

23. The functions of Non Rapid eye movement (NREM) include:
   a) dreaming  
   b) catecholamine synthesis  
   c) protein synthesis  
   d) memory consolidation

24. In defensive mechanisms while coping with stress, displacement is defined as:
   a) expressing the motive in a form that is directly opposite to its original intent  
   b) the temporary separation from conscious awareness to escape an emotional distress  
   c) transferring the emotion from its actual object to a substitute  
   d) concealing the real motive and giving a false rational explanation instead

25. The following is true about intelligence quotient (IQ):
   a) it is defined as giving meaning to sensations  
   b) it cannot classify students in educational grades  
   c) it indicates a person’s mental abilities relative to others of approximately the same age  
   d) it does not help in problem solving

26. Factors affecting attraction are:
   a) reciprocal disliking  
   b) unsuccessfulness  
   c) competency  
   d) difference

27. According to Jean Piaget, stages of cognitive development are of the following EXCEPT:
   a) the sensorimotor stage  
   b) the premoral stage  
   c) the preoperational stage  
   d) the concrete operational stage

28. The following is true about the immediate response to emergency situations:
   a) it is sometimes called “fight or flight” response  
   b) it is mediated by release of corticotropin releasing factor and arginine-vasopressin  
   c) the immune system is suppressed by cortisol in this stage  
   d) it leads to psychosomatic disorders like hypertension and peptic ulcer

29. All of the following are true about emotions EXCEPT:
   a) it is carried out by the Papez-Maclean circuit  
   b) emotions are defined as the process of selecting some stimuli for further processing while ignoring other stimuli  
   c) serotonin is one of the neurotransmitters responsible for emotions  
   d) past experiences, values and motivation can affect interpretation of emotions

30. The structure of an attitude includes the following:
   a) affective component  
   b) behavioural component  
   c) cognitive component  
   d) all of the following

31. Superego is responsible for:
   a) reality testing  
   b) reality principle  
   c) supervising the ego and id  
   d) immediate gratification

32. Stimulus factors that increase perception are:
   a) proximity  
   b) similarity  
   c) good form  
   d) all of the above
33. Prevention and control of aggression are by:
   a) giving amphetamine as pharmacotherapy
   b) allowing the person to express what is inside his mind through an injurious behavior
   c) social skills training
   d) using humor and disrespect on addressing the aggressive person

34. In defensive mechanisms while coping with stress, projection is defined as:
   a) behaving the same way as another
   b) avoidance of awareness of some painful aspects by abolishing
   c) dividing external aspects into "all good" or "all bad"
   d) distributing unacceptable motives to others

35. The following is true about fields of psychology:
   a) psychometry seeks the relationship between physiological process and behavior
   b) developmental psychology is concerned with the factors that shape the behavior from birth to old age
   c) social psychology depends on experiment to study the behavior
   d) physiological psychology is the measurement of psychological function

36. Functions of Rapid Eye Movements (REM) sleep include:
   a) memory consolidation
   b) protein synthesis
   c) restoration of body functions
   d) growth hormone secretion

37. Motivation is defined as:
   a) the ability to mentally represent objects and events as concept formation
   b) the behavior that is directed and intended toward harming or injuring a person
   c) the process of initiating, guiding and maintaining behavior towards a goal
   d) the cognitive process by which sensory stimuli are translated into psychological information

38. Long term memory can be improved by all the following except:
   a) using mnemonics
   b) organization
   c) repression
   d) elaboration by adding details

39. Phases of concept formation:
   a) generalization
   b) differentiation
   c) abstraction
   d) all of the following

40. Information gathering skills in a good doctor-patient relationship is in the following:
   a) open ended questions only should be used throughout the interview
   b) letting the patient direct the flow of information
   c) clarification of what the patient has said to ensure that the doctor understood the patient
   d) closed ended questions only should be used throughout the interview
Answers of MCQ Questions


Answers of MCQ June 2013