ANATOMY

SUPEX

GROUP-A (15 MARKS EACH)

1. Following volleyball practice a player developed dislocation of right shoulder joint.

a) Which nerve may be commonly injured in this case?

b) Enumerate the ligaments of the joint.

c) What are the factors which maintain the stability of the joint?

d) Describe the abduction movement of the joint.

e) What is scapulo-humeral rhythm?

f) Justify the statement- the shoulder joint has gained mobility at the cost of stability.[2+3+2+4+2+2=15] [Purulia] [2020]

2. What is Brachial plexus? How it is formed? Write few lines on supra clavicular block. What are the signs and symptoms of Horner's syndrome and cause of Horner's syndrome?
[2+2+5+5+1] [NRS] [Sagore Dutta] [2020][2019]

3. A factory worker presents with acute pain and swelling in the central part of the palm of his right hand following infection of web space between middle and ring fingers. Briefly describe the fascial spaces of hand. Anatomically explain the cause of the hand swelling in this case. [4+4+4+4] [BSMC] [2020]

4. Answer the following questions in brief and to the point:

A] Which type of cartilage forms- [1/2x6=3]

a) Intervertebral disc

b) Thyroid cartilage

c) Meniscus

d) Glenoidallabrum

e) Epiglottis

f) Costal cartilage

B]Enumerate the layers of urothelium with a suitable diagram.[$1^{1/2}+1^{1/2}=3$]

C]Answer the followings: [1+1+1=3]

a) Which digit does not have palmar interossei?

b) Enumerate the joints of shoulder girdle?

c) Which structure/structures passes/pass through the two heads of pronator teres?

D] Why the clavicle is regarded as modified long bone? [3]

E] Mention the pathway of metastasis of Krukenberg's tumor in breast carcinoma. [3] [MJNMCH] [2019]

5. Describe the ulnar nerve under the following headings:

a) Origin

b) Course

c) Branches

d) Innervations(sensation + motor)

e) Effects of injury at the wrist. [1+4+4+3+3] [MJNMCH][2019]

6. A 60-yr female presented in OPD with a fixed breast lump. It was diagnosed as a case of cancer of breast. What are the structures forming mammary bed with which the tumor is fixed? Describe the arterial supply and lymphatic drainage of breast. Explain the following in this case- i) retraction of nipple, ii) ovarian metastasis. [3+3+4+2.5+2.5] [SRIMS] [2019]

7. Describe the movements of the shoulder joint and the muscles causing them. Which muscles form the "rotator cuff" of the shoulder joint? What is the nerve supply of the shoulder joint? [8+4+3] [RGMC] [2019]

8. A middle-aged woman presents with a lump (swelling) in her right breast and enlarged nodular swellings in right axilla.

a) How do you explain these axillary swellings?

b) How do you classify axillary lymph nodes?

c) Describe the lymphatic system of the breast?

d) What do you mean by Krukenberg's tumor? (2+5+6+2) [MSDMCH] [2019]

9. What is nerve plexus? Mention about the brachial plexus under the following headings with a suitable labelled diagram – root values, formation & branches. What is Erb's paralysis? Mention the course and distribution of the ulnar nerve in hand with its clinical correlates. (1+2+2+2+1+2+3+2)[RPHGMCH] [2019]

GROUP-B (10MARKS EACH)

1. Describe the median nerve under the following heading –

a) Root value

b) Branches

c) Carpal tunnel syndrome

d) Sensory supply (1+3+3) [MMCH] [2020]

2. A patient after fracture around the medial aspect of the elbow joint is unable to play fine musical instruments and hold a pencil between fingers. Describe the anatomical basis and structure involved. Describe the nerve under question under the following headers:

a. Origin and root value.

b. Course and distribution in the hand.

c. Types of Claw hand [2+1+1+4+2] [JIMSH] [2019]

3. A35yr female with thyroid disorder presented with pain and numbness in her right wrist joint and hand. She was diagnosed as a case of Carpal Tunnel syndrome. Discuss the following points of the nerve affected–

i) formation, ii) course, iii) branches and distribution.(2+4+4)[SRIMS] [2019]

4. Apersondevelopsclawhandfollowinganaccidentalfractureofmedialepicondyleofhumerus.

a) Which nerve is involved in this fracture?

b) What is its root value?

c) What are the motor and sensory distributions of this nerve in the hand?

d) What do you mean by claw hand?

e) Which nerve is popularly known as Workman's nerve and why? (1+1+4+2+2)[MSDMCH] [2019]

GROUP-C (SHORT NOTES) (5 MARKS EACH)

1. Immediate & delayed effects of supracondylar fracture of humerus. [Purulia] [2020]

2. Abduction of shoulder joint. [Sagore Dutta] [MMCH] [2020] [2019]

3. Boundaries and contents of cubital fossa .[RGMC] [2020]

4. Supination and pronation of the forearm (Definition, movements of the joints, muscles

involved) [1+1+1] [MJNMCH] [2019]

5. Mid palmar space (Boundary with communications, clinical importance)[1.5+1.5] [MJNMCH] [2019]
6. Superficial palmar arch.[MMCH] [2019]
7. Sensory supply of dorsum of hand.[MMCH] [2019]
8. Median nerve root value and branches[MMCH] [2019]
9. Superficial palmar arch. [RGMC] [2019]

GROUP-D (EXPLAINWHY) (4 MARKS EACH)

1. Ulnar paradox [Purulia] [2020]
2. Avascular necrosis of the distal end at the distal end of terminal phalynx due to injury of digital artery. [MMCH] [2020]
3. Carpal tunnel syndrome. [Sagore Dutta] [2020]
4. Basilic vein is preferred for cardiac catherization. [Sagore Dutta] [2020]
5. Tenderness in anatomical snuff box. [SRIMS] [2020]
6. Paeu d orange appearance of breast in cancer. [SRIMS][BSMC] [2020]
7. Fracture of shaft of humerous causes wrist drop. [DHGMCH] [2020]
8. Winging of scapula. [DHGMC][COMJNM] [2020]
9. A pricking injury at the tip of the thumb or little finger may lead to painful swelling of the palm. [RGMC] [2020]
10. Infectionofpulpspaceoffingerscausenecrosisofdistal4/5thofterminalphalanxleaving1/5thhealthy. [MJNMCH] [2019]
11. Supracondylar fracture of humerus leads to contracture deformity of the forearm muscles, fingers and hand. [MJNMCH] [2019]
12. An enlarged central group of axillary lymph nodes may give rise to pain along the medial side of arm.[SRIMS] [2019]
13. Clavicle is a modified long bone.[SRIMS] [2019]
14. Ulnar nerve injury at the wrist may cause "claw hand" [RGMC] [2019]
15. Lacerated injury of supinator muscle may lead to wrist drop. [MSDMCH] [2019]
16. An elderly lady presenting with axillary nodule should be properly examined[IPGMER]

[2019]

INFEX

GROUP-A (15 MARKS EACH)

1. Describe femoral artery under following headings –

a) Origin

b) Termination

c) Branches

d) Two clinical importance (2+2+5+6) [MMCH] [2020]

2. Name the type and sub-type for the hip joint. Enumerate the four groups of ligaments associated with this joint. State the chief muscles involved in each type of movement. Mention a vessel and nerve with exact locations in front of the joint / blood supply of the hip joint. [1+4+4+3] [NBMC] [COMJNM] [2020]

3. What are the muscles exposed after cutting gluteus maximus? Name the nerves supplying these muscles with root value? What are the actions of these muscles on hip joint? Blood supply of upper end of femur including head? [3+4+3+5] [GIMSH] [2020]

4. A footballer sustained a sprain followed by difficulties in normal movements of his left knee after he attempted to kick the ball with his right foot. He was diagnosed to have an injury of semilunar cartilage. Explain the anatomical basis of his injury. Write a brief note on the semilunar cartilage of the knee joint. What is the unhappy triad of knee joint? [2+5+2] [DHGMC] [2020]

5. An adult patient has come with ambulance stretcher with a history of fall and sustained trauma on right hip joint. His leg is externally rotated. On your knowledge of first prof. anatomy write on these points:

a) Why the leg is externally rotated

b) Capsular attachment of hip joint

c) Ligament of joint

d) Blood supply of upper end of femur including head [3+4+4+4] [NRS] [2020]

6. A footballer visited OPD with complain with pain in the right knee. It was found his medial meniscus is torn. Give details of the medial and lateral menisci of knee joint.

Name the other ligaments of knee joint. Why medial meniscus is more prone to injury than lateral meniscus? Discuss about the mechanism of locking and unlocking movement of knee joint. Define inversion and eversion of the foot. Mention the joints involved and the muscles causing such movements. (3+3+3+2+4)[SRIMS] [2019]

7. What are the compartments (neuro, vasculo muscular) present in the leg region? Enumerate the structures present in the antero-lateral compartment. Write the origins, insertion, nerve supply and actions of muscles present in this compartment.(2+3+10)[RGKAR] [2019]

8. Describe the arches of foot. Describe the highest one under the following headings – bones forming it, ligaments, and factors maintaining the arch. What is peripheral heart? Give a brief account of great saphenous vein (formation, course, tributaries, applied). (1+2+2+2+2+1+2+2+1) [RPHGMCH] [IPGMER] [2019]

GROUP-B (10MARKS EACH):

1. Describe femoral triangle –

a. Boundaries

b. Contents

c. Branches of femora artery in the triangle

d. What is "Butcher's thigh"? [RGKAR][GIMSH] [2020]

2. Describe the femoral nerve under the following headings –

a) Root value

b) Branches

c) Saphenous nerve

d) Sub-sartorial plexus (2+2+4+2) [MMCH] [2020]

3. What are the boundaries of popliteal fossa? Enumerate the contents of popliteal fossa. Describe the popliteal artery with length. (4+3+3) [MMCH] [2020]

4. Enumerate the arches of foot. Describe the factors maintaining the medial longitudinal arch. Add a note on pes cavus. [2+6+2] [Purulia][2020]

5. Discuss the following points on Great Saphenous vein – i) formation ii) termination iii) tributaries. How varicose veins are formed? (1.5+1.5+5+2)[Sagore Dutta] [SRIMS] [2020] [2019]

6. Describe the intra-articular ligaments of knee. What is the unhappy triad of knee?

[7+3] [JIMSH] [2020]

7. A footballer sustained a sprain followed by difficulties in normal movements of his left knee after he attempted to kick the ball with his right foot. He was diagnosed to have an injury of semilunar cartilage. Explain the anatomical basis of his injury. Write a brief note on the semilunar cartilage of the knee joint. What is the unhappy triad of knee joint? [2+5+2] [DHGMC] [MSDMCH] [2020] [2019]

8. A man of 26 years brought to emergency following road traffic accident with huge swelling in front of left thigh. What may be the possibility? Describe the blood supply of a long bone. Draw a labeled diagram of arterial anastomosis around knee joint. [1+5+4] [BSMC] [2020]

9. Describe the knee joint under the following headings:-

A) Type and subtype of joint c) locking unlocking mechanism

B) Unhappy triad d) anterior drawer test and what this test helps to determine [2+4+2+2] [IQ city][2020]

10. State with reasons of locking and unlocking movements of knee joint with diagram.(7+3) [NRS] [2019]

11. What is venous ulcer? Write in short venous drainage of lower limb.(3+7) [NRS] [2019]

12. Enumerate the Hamstring muscles. Mention the characteristic features of true hamstrings. What is modified hamstring muscle? Enumerate all the ligaments of knee joint. (2+4+1+3) [RPHGMCH] [2019]

13. Give an account of capsular ligament of hip joint regarding its attachment around the joint. Enumerate other ligaments of hip joint. Enumerate different muscles responsible for abduction and flexion movement of the joint. What is Trendelenburg's sign? (3+2+2+2+1)[IPGMER] [2019]

GROUP-C (SHORT NOTES) (5MARKSEACH)

1. What is varicose vein ulcer? What are factors which favor formation of varicose veins in the lower limb?(2+3=5) [Purulia] [2020]
2. Bursae in front of knee joint. [RGKAR] [2020]
3. Write briefly about femoral sheath in the following aspects-

a) Walls

b) Compartments

c) Contents

d) Applied aspects [NBMC] [Sagore Dutta] [RPHGMCH] [2020] [2019]

4. Medial longitudinal arch of foot. [NBMC] [2020]
5. Contents of Hunter's canal. [GIMSH] [2020]
6. Arteries forming cruciate and trochanteric anastomosis. [GIMSH] [2020]
7. Genicular anastomosis. [COMJNM] [2020]
8. Saphenous nerve. [MMCH] [2019]
9. Femoral nerve. [Sagore Dutta] [2019]
10. Popliteus muscle. [COMJNM] [IQ City] [2020] [2019]
11. Locking of knee joint. [RGMC] [2019]
12. Long Saphenous vein–formation & tributaries[MSDMCH] [2019]

GROUP-D (EXPLAINWHY) (4MARKSEACH)

1. Semimembranous is a true hamstring muscle. [RGKAR] [2020]
2. Pointing index. [MMCH] [2020]
3. Down heel running can cause injury to the ankle joint. [MMCH] [2020]
4. Medial meniscus is more prone to injury than lateral meniscus. [MMCH] [NBMC][MCK] [2020]
5. Fracture of neck of talus leads to avascular necrosis. [MMCH] [2020]
6. Soleus is known as peripheral heart. [Purulia] [Sagore Dutta] [2020]
7. Femoral hernia is common in female. [Sagore Dutta] [RGKAR] [2020] [2019]
8. Injury to superior gluteal nerve shows positive trendelenberg's sign. [GIMSH] [MSDMCH] [DHGMC] [2020] [2019]
9. Fracture of neck of fibula causes foot drop and inverted foot.[JIMSH][KPC] [2020] [2019]
10. Pubic tubercle is the landmark to differentiate inguinal hernia and femoral hernia. [SRIMS] [2020]
11. Peroneus longus muscle maintains both longitudinal and transverse arches of foot. [DHGMC] [2020]
12. A Traffic policeman commonly suffers from varicose vein/ has prominent veins in the leg.[RPHGMCH][BSMC] [2020] [2019]

13. While jogging a middle-aged man hears a snap and feels a sudden pain in the lower part of right leg. He finds the area swollen and there is a gap between the right heel and the swelling. He is unable to planter flex his right ankle joint. Explain the clinical condition and state briefly the risk factors involved in this clinical case. [2+2] [MCK] [2020]
14. Trendelenburg sign positive in right lower limb of a patient. [SRIMS] [2019]
15. Flat foot due to mal-development of spring ligament.[RGKAR] [2019]
16. Adductor magnus has dual nerve supply[RGMC] [2019]
17. Inability to dorsi flex foot following fracture of neck of fibula with superficial laceration. [GIMSH] [2019]

THORAX

GROUP-A (15 MARKS EACH)

1. One 40 year old female patient attends the emergency complaining pain behind the sternum & also inner side of left arm. Explain the condition anatomically. Mention the origin, course, branches & distribution of right coronary artery with suitable diagrams. What is coronary dominance? What is annulus of vieussens? [2+1+2+3+3+2+2] [Purulia] [NBMC] [JIMSH] [2020]

2. What are the different features visible in interatrial septum? Enumerate the embryological sources of development of interatrial septum. Write a note on tetralogy of fallot. [4+4+4] [NBMC] [IPGMER] [MJNMCH] [2020] [2019]

3. Patient with pleuritis presents with pain along the root of the neck. Explain anatomically. Describe the nerve supply of the pleura with clinical importance. Write a brief note on the apex of the lung. [3+3+4] [JIMSH] [2020]

4. Enumerates the parts of the pleura with their nerve supply. Describe the costomediastinal reflection of pleura. What is pleural effusion? [2+4+4+2] [DHGMCH] [2020]

5. What are bronchopulmonary segment? Enumerate the bronchopulmonary segment of left lung. Draw a labeled diagram illustrating the segment of left lung. Mention the vascular supply of the segments along with the clinical importance. [2+4+4+5] [ICARE] [2020]

6. A child presents with recurrent attack of common cold and breathing difficulty and is diagnosed to have atrial septal defect. Describe the process of development of atrial septum with diagram. Embryologically explain the different features seen in adult atrial septum. Enumerate the development defects of atrial septum.(10+3+2) [BSMC] [BMC] [2019]

7. Give an account of the venous drainage of the thoracic wall. What is the fate of the sinus venous? (8+4) [MCK] [2019]

8. What do mean by mediastinum? Enumerate the contents of superior mediastinum. Describe the arterial supply of the heart under following headings – origin, courses and branches with distribution pattern with suitable labeled diagram. "Heart lies outside the serous pericardium but within the fibrous pericardium" –justify the statement on embryological basis.(1+2+2+2+3+2+3) [RPHGMCH] [2019]

GROUP-B (10MARKS EACH)

1. Enumerate the boundaries of the inlet of thorax? What is thoracic inlet syndrome? Draw a labeled diagram depicting medial surface of left lung. What is costo-diaphragmatic recess & its clinical significance? What is the ideal site of pleural tapping? What are the various structures penetrated by a needle during pleural tapping? Which ribs predominantly show pump handling movement during inspiration? (2+2+4+3+1+2+1) [MJNMCH] [2020]

2. Mention the origin, course and tributaries of the coronary sinus. What do you mean by coronary dominance? [1+3+3+3] [SRIMS&SH] [MJNMCH][DHGMCH] [2020]

3. Describe the mechanism of respiration under the following heading: a) Change of diameter of thoracic cage, b) types of movements, c) muscles responsible for different movements. Enumerate the different type of cells present in the trachea-bronchial tree.(6+4) [MMCH] [MJNMCH] [2020] [2019]

4. A patient with complain of chest pain was diagnosed to suffer from 'triple vessel disease'. What are the three vessels referred here? What is coronary dominance and its importance? Describe the development of interatrial septum with labeled diagram. [BMC] [2020]

5. Mention the origin, course, and branches of right coronary artery. What do you mean by coronary dominance? [1+3+3+3][ICARE] [2020]

6. Thoracic diaphragm. [COMJNM] [2019]

7. Enumerate the major openings of the diaphragm and the effect of respiration on

them. Mention the different sources of its development. What is Bochdalek hernia? (6+3+2) [BSMC] [2019]

8. Describe the contents of the first intercostals space. How does this space differ from a typical intercostal space? (3+4) [MCK] [2019]

9. Describe the attachments of the diaphragm. Name the major opening of the diaphragm and list the structures passing through them. (5+5)[RGMC] [2019]

10. Describe the features present in the interior of right atrium. What are the tributaries of the coronary sinus.(7+3) [RGMC] [2019]

11. An elderly man presenting with acute onset of severe pain in chest and sweating was diagnosed as acute myocardial infarction.

a) Enumerate the arteries that supply the ventricles of heart.

b) What are the tributaries of coronary sinus? (7+3) [MSDMCH] [2019]

12. Describe the interior of right atrium and enumerate veins draining into right atrium. Write down developmental source of fossa ovalis. (5+3+2) [KPC] [2019]

GROUP-C (SHORT NOTES) (5MARKSEACH)

1. Bronchopulmonary segments. [NBMC] [RGMC] [2020] [2019]

2. Azygous vein. [Sagore Dutta][DHGMCH] [2020]

3. Development of interventricular septum[Sagor Dutta] [RPHGMCH] [2020] [2019]

4. Oblique sinus of pericardium.[SRIMS] [2020]

5. Costo-diaphragmatic recess of pleura. [SRIMS] [2020]

6. Enumerate the minor openings of diaphragm. [COMJNM] [2020]

7. Defects of tetralogy of Fallot. [RGMC] [2020]

8. Hilum of lungs. [BMC] [2020]

9. Development of right atrium.[MMCH] [2019]

10. Respiratory part of lung.[MMCH] [2019]

11. Transverse pericardial sinus [BSMC] [2019]

12. Thoracic duct–formation, course, termination & tributaries [RPHGMCH] [2019]

GROUP-D (EXPLAINWHY) (4MARKSEACH)

1. Tension Pneumothorax. [MMCH] [2020]
2. A 45 year old male comes at OPD with soft swelling at the right 5th costo-chondral junction and tenderness at the spine of 5th thoracic vertebra. [MMCH] [2020]
3. 1st intercostals nerve is atypical. [Purulia] [2020]
4. A patient with mitral stenosis presents with dysphagia.[MJNMCH] [2020]
5. Fibrous pericardium is fused with central tendon of diaphragm. [MCK] [JIMSH] [2020]
6. Enumerate the types of respiration at birth, in infant and in adult with anatomical reason? [JIMSH][MSDMCH] [2020] [2019]
7. Right lung is more prone to aspiration pneumonia.[SRIMS] [2020]
8. 2nd intercostals nerve is atypical.[DHGMCH] [MCK] [2020] [2019]
9. Only 3rd to 6th intercostal nerves are called TYPICAL INTERCOSTAL nerves. [RPHGMCH] [2020]
10. Sternal angle is an important anatomical landmark.[BMCH] [2020]
11. Importance of presence of C shaped cartilage in trachea.[BMCH][2020]
12. Right lung is prone to pneumonia [ICARE] [2020]
13. Infants are susceptible to pneumonia after abdominal operations. [BSMC] [2019]
14. A tumor at the apex of the lung may produce Horner's syndrome[BSMC] [2019]
15. Pain due to irritation of the respiratory diaphragm may be felt at the tip of the shoulder. [MCK] [2019]
16. Impaction of foreign body in right bronchus. [BMC] [2019]
17. Why cardiac pain radiates to the left upper arm. [NRS] [2019]
18. Inter-costal drain must be put along the upper border of lower rib along mid-axillary line. [RPHGMCH] [2019]

ABDOMEN

GROUP-A (15 MARKS EACH)

1. A female patient develops left sided hydro-ureter following hysterectomy operation.

a) What is hydro-ureter?

b) Explain anatomically the cause of hydro-ureter and why it is commoner in the left side?

c) Mention the structures related to supra-vaginal cervix.

d) Draw a schematic labeled diagram of micro-structure of ureter.

e) Write down the mode of arterial supply of ureter.

f) Discuss in short developmental anomalies of ureter. (2+2+3+3+2+3=15) [Purulia] [2020]

2. What is menstruation? Describe the phases of menstruation with anatomical basis. What is living ligature of uterus? (1+12+2) [MMCH] [2020]

3. Discuss the different stages of development of kidney. What is polycystic kidney? (4+4+4+3) [MMCH] [2020]

4. Describe the kidney under following headings

a) Location

b) Relations which are common in both kidneys.

c) Disposition of renal fascia.

d) Embryological development.

e) Diagram of microscopic anatomy.

f) Renal angle. [1+3+3+5+2+1] [MJNMCH] [2020]

5. Per vaginal examination of an elderly lady suffering from pelvic inflammatory disease reveals collection of fluid in Pouch of Douglas.

a) Write a note on Pouch of Douglas and posterior colpotomy?

b) Write on peritoneal as well as visceral relations of uterus.

c) Give a brief account of support of uterus.

d) What is prolapse of uterus? [3+4+6+2] [GIMSH] [2020]

6. Horse shoe kidney occupies a lower position than a normal kidney. Explain anatomically. Describe the development of kidney with suitable diagram. Write a brief note on developmental anomalies. Draw a labeled diagram of the coronal section of the kidney. [3+4+4+4] [JIMSH] [2020]

7. Patient presents with inflammation of the ovary present with pain along the medial side of the thigh and knee. Explain anatomically. Describe the root value, course and distribution of the nerve affected. What is sub sartorial plexus? [3+1+5+4+2] [JIMSH] [2020]

8. A bout of hematemesis in a patient suffering from cirrhosis of liver was diagnosed to be due to obstruction of portal venous system. Describe portal vein under following headings: formation, relation and sites of portacaval anastomosis. Enumerate the ligaments of spleen. [2+3+4+3] [DHGMCH] [2020]

9. A male child came to OPD with unilateral empty scrotum, diagnosed to have ectopic testis :-

a) What are the possible sites to look for the presence of testis in this case?

b) Explain the condition embryologically.

c) Describe the factors responsible for descent of testis.

d) Draw a labeled diagram of microstructure of testis. [2+3+6+4] [BSMC] [2020]

10. Support of uterus, ligaments of uterus, contents of broad ligaments of uterus. [5+5+5] [COMJNM] [2020]

11. What do you mean by the terms "version" and "flexion" of uterus? In relation to this, describe normal anatomical position of uterus. Give an account of various types of support of uterus. Write in brief the lymphatic drainage of uterus with clinical importance. What is clinical importance of recto uterine pouch of Douglas? [2+2+6+3+2] [MCK] [2020]

12. Give a brief account of the inguinal canal under following headings :-

a) Location, length, extent

b) Boundaries

c) Contents

d) Defence mechanism of the inguinal canal

e) Compare anatomically different types of inguinal hernia. [3+4+2+3+3] [MCK] [2020]

13. What is trachea-oesophageal fistula? Enumerate the embryological derivatives of mesogastrium. Give a brief account on mid gut rotation with suitable diagram and fate of vitello-intestinal duct. Enumerate the different type of ectopic position of testis with clinical importance. [2+3+5+2+3=15] [RPHGMCH] [2020]

14. An 8 year old boy was admitted to the hospital with a temperature of 101° F, a furred tongue, and vomiting he complained of an initial vague dull discomfort in the umbilical region followed by a severe localized pain felt in the right iliac region. On examination, the skin on the right lower quadrant was tender to the touch, and the abdominal muscles were contacted and rigid. A diagnosis of acute appendicitis was made.

A) Explain the cause of the referred pain in the patient.

B) Mention 2 cardinal points to outline the histological structures of appendix.

C) Mention the variations of the appendix according to the position of its tip along with a suitable well labeled diagram. [5+2+8] [RGMC] [2020]

15. A 60 year old patient comes to the OPD with complain of hematemesis. He gives a history of chronic alcoholism and on clinical examination he is found to have a firm and enlarged liver and ascites. Investigations reveal bleeding varices. Enumerate three sites of porta caval anastomosis and name the anastomosing vessels. Describes the structures of hepatic lobule with a labeled diagram. Explain anatomically why varices are formed at sites of porta caval anastomosis in cirrhosis. [3+3+5+4] [BMCH][2020]

16. Describe Anal canal under the following headings:

(i) Internal features (ii) blood supply (iii) nerve supply (iv) hemorrhoids (5+5+2.5+2.5) [COMJNM] [2019]

17. In a 65 yr male patient with carcinoma of prostate, lumbar vertebrae metastasis was found in x-ray. From your knowledge of anatomy explain this complication. Discuss about the capsule and relations of prostate gland with diagram. Add a note on interior (prostatic urethra)of the organ.(3+3+4+5) [SRIMPS] [2019]

18. Give a brief account of the supports of the uterus. What is "anteversion and anteflexion" of the uterus? What do you mean by "external os" of the uterus? (8+4+3) [RGMC] [2019]

19. Enumerate the sites of portacaval anastomosis. What is esophageal varices? Give a brief account of porta-hepatis of liver. Draw an H/E section of liver as viewed under low power microscope and label it. Which structure of portal triad has the smallest diameter? What is a portal lobule? (2+2+3+5+1+2) [RPHGMCH] [2019]

20. A 50 year old lady presents in gynae OPD that something is coming down through vaginal orifice. On examination it is found that uterus is coming down through orifice. What are the characteristic of different parts of uterus? Describe the support of uterus. Enumerate different parts of uterine tube. Write a note on ectopic pregnancy. (4+6+2+3) [IPGMER] [2019]

GROUP-B (10 MARKS EACH)

1. What are the supports of the uterus? What is perineal body and discuss its clinical importance. [5+2+3] [MMCH] [2020]

2. Mention the factors which prevent prolapse of uterus. Describe the relations of

supravaginal cervix. Add a note on ectopic pregnancy. [3+4+3] [Purulia] [2020]

3. Mention the different sites of porta-caval anastomosis. Enumerate the veins participating in the anastomosis with a labeled diagram. In which condition enlargement of these veins occur? [2+4+3+1] [Purulia][GIMSH] [IPGMER] [2020] [2019]

4. Describe the supports of uterus with diagram. Describe the development of vagina. What is site of formation of portal vein? [5+4+1] [MJNMCH] [2020]

5. Describe the different ligaments of stomach and their contents. Enumerate the ligaments of urinary bladder. Describe splenic circulation. [4+3+3] [MJNMCH] [2020]

6. Write briefly about prostatic urethra. Mention the microscopic structure of prostate. Add a note on superficial perineal pouch. [4+3+3] [SRIMS] [2020]

7. A fatty lady of 45 years with a long history of hyperacidity and dysphagia was brought to hospital with acute pain in epigastrium and in right shoulder tip. She was diagnosed as a case of cholelithiasis. Using you're your anatomical knowledge, explain the pain in both epigastrium and tip of right shoulder. Enumerate the boundaries of Calot's triangle. What is surgical importance? [3+3+2+2] [BSMC] [2020]

8. During USG right kidney was found in the pelvic cavity. Why downward displacement of the kidney is not associated with displacement of suprarenal gland? What do you mean by segmental artery supply of the kidney? [3+3+4] [BSMC] [2020]

9. What do you mean by lesser sac? Enumerate its boundaries of and recesses. Explain with the help of labeled diagram. [2+3+3+2] [MCK] [2020]

10. Compare the relations of anterior surfaces of both the kidneys with diagrams. Briefly give the outlines of the development of metanephric kidneys. What is horse-shoe kidney? [4+5+1] [MCK][2020]

11. Give a brief account on the extrahepatic biliary apparatus. How and where does portal vein form? A chronic alcoholic person suffers from repeated bouts of hematemesis. What is your provisional diagnosis? Explain the reason of hematemesis in this case? [5+2+1+2] [RPHGMCH] [2020]

12. A 14 year old male student is brought to the hospital with abdominal pain, fever, nausea, and episodes of vomiting. Examination reveals the pain to be diffuse in nature and felt around the umbilicus. The following day, the patient describes the pain to have moved to his right iliac fossa and there is maximum tenderness at a point on the right spino-umbilical line (Murphy's triad positive).

A) What is the provisional diagnosis?

B) Describes the gross anatomy of the involved viscus including its blood and nerve supply.

C) Outline the histological features of the involved viscus

D) Explain the anatomical basis for the change in site and nature of the pain [1+4+3+2=10] [IQ City] [2020]

13. What are the parts of the stomach? How stomach bed is formed. Give blood supply of stomach with diagram. [2+3+5] [ICARE] [2020]

14. Describe rectus sheath [ICARE] [2020]

15. Write extrahepatic biliary apparatus. [ICARE] [2020]

16. Compare the relation of anterior surface of both kidneys. Write notes development of kidney. [5+5] [ICARE] [2020]

17. A 45 yr male presented in OPD with a swelling in groin. It was diagnosed as inguinal hernia. Discuss the inguinal canal under following heading–boundaries, content and protective mechanism. (4+3+3) [SRIMS] [2019]

18. An adult male presents with inguino-scrotal swelling of right side.

a) What is inguinal canal?

b) What are its boundaries?

c) How do you differentiate between direct and indirect inguinal hernias? (2+3+5)[MSDMCH] [2019]

19. What is marginal artery of Drummond? Enumerate the branches of superior mesenteric artery with a suitable diagram. How does a part of small gut get its arterial supply from the main artery? Which type of appendix is more prone to develop peritonitis when inflamed? (2+4+3+1) [RPHGMCH] [2019]

GROUP-C (SHORT NOTES) (5MARKSEACH)

1. Decent of testis: cause and ectopic testis. [Purulia] [RGKAR] [GIMSH] [JIMSH] [IPGMER] [2020] [2019]
2. Explain anatomically the cause of jaundice in carcinoma of head of the pancreas? Add a note on annular pancreas.(2+3=5) [DHGMC] [2020]
3. Lesser sac / Omental bursa. [RGKAR] [NBMC] [2020]
4. Coeliac trunk. [MMCH] [2020]
5. Enumerate the structures of spermatic cord. What is encysted hydrocoele of spermatic cord? [3+2][COMJNM] [2020]
6. The messentry. [Sagore Dutta] [2020]

7. Rotation of gut. [Sagore Dutta] [COMJNM] [2020]
8. Ectopic pregnancy. [Sagore Dutta] [2020]
9. Ischio-Anal Fossa. [MJNMCH] [COMJNM] [RGMC] [2020] [2019]
10. Bare area of liver. [GIMSH] [2020]
11. Muscles forming Perineal Body. [GIMSH] [2020]
12. Derivatives of ventral mesogastrium. [GIMSH] [2020]
13. Derivatives of mesonephric duct in males. [GIMSH] [2020]
14. Branches of lumber plexus with root value. [GIMSH] [2020]
15. Structures crossed by the root of messentry. [GIMSH] [2020].
16. Posterior relations of right and left kidneys. [GIMSH] [2020]
17. Constriction of oesophagus and its clinical importance. [JIMSH] [2020]
18. Lumbar plexus. [SRIMS] [2020]
19. Splenic circulation. [DHGMCH] [2020]
20. Imperforate anus. [DHGMCH] [2020]
21. Meckel's diverticulum. [COMJNM] [2020]
22. Blood supply of stomach. [COMJNM] [2020]
23. Root of messentry. [COMJNM] [2020]
24. Rectus sheath formation [Sagore Dutta] [COMJNM] [2020]
25. Suprarenal gland. [COMJNM] [2020]
26. Processus vaginalis. [MCK][2020]
27. Hepato-renal pouch of Morrison. [MCK] [2020]
28. Physiological umbilical hernia. [MCK] [2020]
29. Support of uterus. [RPHGMCH] [Malda] [ICARE] [2020]
30. Perineal body.[BMCH] [2020]
31. Trigone of urinary bladder. [BMCH] [2020]
32. The mesentery [IQ City] [2020]
33. Mesonephric duct and its derivatives [IQ City] [2020]
34. Hirschsprung's disease [IQ City] [2020]
35. Development testis and ectopic testis [Malda] [2020]
36. Paramesonephric duct [Malda] [2020]

37. Describe pancreatic duct, what is ampulla of vetter. [ICARE] [2020]
38. Write boundary of epiploic for amen with diagram. What is the applied anatomy of epiploic foramen? [ICARE] [2020]
39. Development of pancreas along with the duct system.[COMJNM] [2019]
40. Gubernaculum testis.[MMCH] [2019]
41. Development of pancreas. [COMJNM] [2019]
42. Support of uterus. [COMJNM] [2019]
43. Pouch of Douglas. [BMC] [2019]
44. Microstructure of pancreas.[RPHGMCH] [2019]
45. Superficial inguinal lymph node. [KPC] [2019]

GROUP-D (EXPLAINWHY) (4MARKSEACH)

1. Varicocele of left testis is more common.[Purulia][MJNMCH] [SRIMS] [2020] [2019]
2. Autonomic bladder. [RGKAR] [2020]
3. Physiological Hernia. [RGKAR] [2020]
4. VAGINA is composite in development. [RGKAR] [2020]
5. Appendicitis is not common in infant and elderly. [MMCH] [2020]
6. Bacterial infection of vagina is more common in elder and before menarche. [MMCH] [2020]
7. Carcinoma of prostate may present with low back pain. [Purulia][RPHGMCH] [2020]
8. In inflammation of appendix pain is first felt in umbilical region. [NBMC] [2020]
9. Pain in ovary may refer to hip and knee joint. [Sagore Dutta] [RPHGMCH] [2020] [2019]
10. Ureteric colic pain spreads from loin to groin. [Sagore Dutta] [2020]
11. Carcinoma of the head of pancreas often produces obstructive jaundice. [MJNMCH] [MCK] [IQ City][RGMC][2020]
12. A patient with cirrhosis of liver with portal hyper tension presents with hematemesis and internal piles. [MJNMCH] [2020]
13. A new born male baby manifests with passing of stool through umbilicus. [MJNMCH] [2020]
14. A patient of cirrhosis of liver presents with "Caput Medusae". [GIMSH] [2020]

15. Abscess of perineal space are very painful in comparison to ischio-rectal space. Why? [GIMSH] [2020]
16. Non-appearance of ureteric bud on one side leads to agenesis of kidney on the same side. [GIMSH] [2020]
17. Patient with ureteric colic present pain along the anterior aspect of the thigh. [JIMSH] [2020]
18. Vermiform appendix is called abdominal tonsil.[SRIMS] [RGMC] [2020] [2019]
19. Umbilical urinary fistula in new born baby. [DHGMCH] [2020]
20. Extravasation of urine following rupture of urethra extends up to axilla. [DHGMCH] [2020]
21. A patient with prostate cancer is advised for X-ray lumbar spine. [BSMC] [2020]
22. Peptic ulcer is common in 1st part of duodenum. [BSMC] [2020]
23. Incisions are preferably made along Langer's line. [BSMC] [2020]
24. Prostatic carcinoma usually affects the outer zone. Explain. [COMJNM] [2020]
25. Neurogenic bladder. [COMJNM] [2020]
26. Extravasation of urine occurs following injury to the perineum. [COMJNM] [2020]
27. Greater omentum is also called the "policeman of abdomen". [RPHGMCH] [2020]
28. Strangulated inguinal hernia is an emergency situation. [RPHGMCH] [2020]
29. Gastric ulcer is common along gastric canal. [RPHGMCH] [2020]
30. Rupture of the urethra just below the perineal membrane leads to extravasation of urine in the anterior abdominal wall.[BMCH] [2020]
31. Pain in the acute appendicitis is initially felt around the umbilicus. [BMCH] [2020]
32. Varicocele is common on the left side .[BMCH] [2020]
33. There is congenital polycystic disease of the kidney. [IQ City] [2020]
34. Mother is presenting his male child of 6 years age to you with a complain of no testis is present in the scrotum. Explain on your anatomical knowledge on embryology the engine which is carrying it into the scrotum and the possible sites of arrest of his pathway. [NRS] [2020]
35. Appendix is called abdominal tonsil. [ICARE] [2020]
36. Duodenal ulcers commonly occur in the first part of duodenum.[COMJNM] [2019]
37. Infantsaresusceptibletopneumoniaafterabdominaloperations.[COMJNM] [2019]
38. Pectinate line is an important landmark of anal canal. [SRIMS] [2019]
39. Haemorrhage from cystic artery may be controlled by compressing free margin of lesser

omentum[RGMC] [2019]

40. Pain of appendicitis felt at umbilical site.[NRS][MSDMCH] [2019]

41. Justifytheidealsiteforinsertionofneedleduringlumbarpuncture.[MSDMCH] [2019]

42. Lesser curvature of stomach is more prone to gastric ulcer.[MSDMCH] [2019]

43. Suprarenalglanddoesn'tfollowkidneywhenthelatterdropsdown.[RPHGMCH] [2019]

44. A new born male child suffers from dribbling of urine from ventral aspect of penis. [RPHGMCH] [2019]

45. Caries spine of lumbar vertebrae may produce swelling of femoral triangle. [RPHGMCH] [2019]

HEAD AND NECK

GROUP-A (15 MARKS EACH)

1. A 40 year old woman presented with hoarseness of voice following thyroidectomy operation.

a) Explain the above statement from your knowledge of anatomy

b) Which precautionary step could avoid the abovementioned complications?

c) Give a brief note on muscles acting on vocal cord.

d) Describe the arterial supply and venous drainage of thyroid gland.

e) Why does the thyroid gland move with deglutition?

f) Add a note on thyroglossal cyst. (2+1+3+4+2+3)[Purulia] [2020]

2. Describes human pharynx under following heading ; A) Muscles B) nerve supply c) structure passing between muscles D) Features present inside nasopharynx [Malda] [2020]

3. Describe the Temporo-mandibular joint under the following headings :

(i) Bones forming the joint (ii) articular disc (iii) ligaments (iv) movements (2.5+2.5+5+5) [COMJNM] [BMC] [2019]

4. A 60 years old man with habit of smoking presents with hoarseness of voice diagnosed as carcinoma of larynx. How will you subdivide the cavity of larynx? What are the

boundaries of laryngeal inlet? How the laryngeal inlet is regulated? Mention of nerve supply of larynx. What is watershed line of larynx and why called so? (3+2+3+4+3) [BSMC] [IPGMER] [2019]

5. Following surgical operation of right sided parotid gland, a patient develops weakness of facial muscles of that side. Which nerve is likely to be injured during this surgery and why? Mention its functional components. Describe the course and branches of the intra temporal segment of the affected nerve.(3+4+5+3)[BSMC] [2019]

6. A 42-yr old male patient comes to the OPD with a history of sudden exposure to cold and presents with loss of transverse wrinkles of his forehead on the left side and deviation of angle of his mouth to the right side. (a)Which nerve of which side is most likely to be affected?(b) Write an account of that nerve under the following headings i) nuclei of origin ii) functional components and iii) course(c) Explain anatomically the clinical features of this condition. (1+2+2+3+4=12) [MCK] [2019]

7. Describe the tongue under the following headings:

a) Gross features

b) Muscles,

c) Nerve supply

d) Development (2+4+4+2=12) [DHGMC] [2019]

8. Name the different cartilages of larynx. Describe the different positions of vocal cord during phonation and name the muscles acting on it in respective positions. Mention the effect of unilateral and bilateral damage of recurrent laryngeal nerve. (3+4+4+4) [BMC] [2019]

9. A swelling is noted in the front of neck which moves with swallowing. On examination it is found to be thyroid swelling. Explain why it moves with swallowing. Describe the gland under the following headings: position, covering, relations and blood supply.(3+3+3+3+3) [BMC] [2019]

10. Name all the cartilages of larynx. What specially lies with the cricoids cartilage other than the cartilages of larynx and trachea? Describe the motor and sensory nerve supply of larynx and it's applied. (3+2+10) [RGKAR] [2019]

11. Describe the inlet of the larynx. Name the muscles of the larynx with their nerve supply. Which muscle is called "the safety muscle of the larynx" and why? (3+8+4)[RGMC] [2019]

12. Give a brief account of development of tongue and its developmental anomalies. Explain the nerve supply of tongue on developmental basis. Name safety muscles of tongue. (7+3+4+1)[KPC] [2019]

GROUP-B (10 MARKS EACH)

1. Development of upper lip and its anomalies [Malda] [2020]

2. Write relation of pharynx, Describe mechanism of deglutition. [ICARE] [2020]

3. Medial wall of middle ear. [COMJNM] [2019]

4. Enumerate the intra tympanic muscles. Mention their nerve supply, development and functions. What is sinus tympani and what is its clinical importance? (2+6+2)[BSMC] [2019]

5. Describe visual pathway including its applied aspect. What is papillary light reflex?(7+3) [BSMC] [2019]

6. Mention the role of various muscles in different movement of temporo-mandibular joint. Mention different functional components and nuclei of glosssopharyngeal nerve. Name the different branches of vagus nerve in the neck.(4+3+3) [MJNMCH] [2019]

7. Mention the blood supply of tonsil & nerve supply of tympanic membrane and soft palate.(3+3+4) [MJNMC] [2019]

8. Name the para-nasal sinuses and their communications with the nasal cavity. Mention the functions of these sinuses. Describe the maxillary air sinuses with clinical importance.(4+2+4) [RGKAR] [2019]

9. Give an account of development of face. Mention the developmental defects of face.(8+2) [RGKAR] [2019]

10. Describe briefly the structures passing through the parotid gland. What is the nerve supply of the parotid gland? (5+5) [RGMC] [2019]

11. How is mandible developed? What are the changes of mandible with age? (5+5) [NRS] [2019]

12. A child was brought to ophthalmology OPD for constant watering of one eye.

a) Explain the anatomical causes of this symptom,

b) Enumerate the structures forming lacrimal apparatus,

c) Prepare a flow chart of the secreto-motor pathway to lacrimal gland. (2+4+4)[MSDMCH] [2019]

13. A10yearchilddevelopsotitismediafollowingrecurrent pharyngitis.

a. What is its anatomical explanation?

b. Which cranial nerve is related to the walls of middle ear?

c. What are the functional components of this nerve?

d. What is Bell's palsy? (2+1+4+3)[MSDMCH] [2019]

GROUP-C (SHORT NOTES) (5 MARKS EACH)

1. Layers of retina with diagram. [Purulia] [2020]
2. Derivatives of 1st Branchial arch. [Sagore Dutta] [2020]
3. Nerve supply of larynx. [Sagore Dutta] [2020]
4. Styloid apparatus [ICARE] [2020]
5. tm joint [ICARE] [2020]
6. tonsil [ICARE] [2019]
7. Platysma muscle.[MMCH] [2019]
8. Layers of retina.[MMCH] [2019]
9. Lymphatic drainage of tongue[MMCH] [2019]
10. Nerve supply of parotid gland. [Sagore Dutta] [2019]
11. Auditory tube.[Sagore Dutta] [2019]
12. Development of tongue[Sagore Dutta] [2019]
13. Thyrohyoid membrane[MCK] [2019]
14. Maxillary air sinus. [MJNMCH] [2019]
15. Secretomotor pathways of lacrimal gland.[MJNMCH] [2019]
16. Lacrimal apparatus.[RGKAR] [2019]
17. Little's area of nose.[DHGMC] [2019]
18. Safety muscles of larynx. [DHGMC] [2019]
19. Types and functions of paranasal air sinus.[NRS] [2019]
20. Lateral pterygoid muscle–attachments, nerve supply and function. [RPHGMCH] [2019]
21. Aqueous humor –formation, circulation and applied importance.[IPGMER] [2019]

GROUP-D (EXPLAIN WHY) (4 MARKS EACH)

1. Fourth layer of scalp is dangerous layer. [Purulia] [KPC] [2020] [2019]
2. Nerve supply of tongue is different in anterior 2/3 and posterior 1/3. [Purulia] [2020]

3. Cleft palate. [Sagore Dutta] [2020]
4. Facial artery is tortuous in its course in face. [Sagore Dutta] [2020]
5. Bell's palsy. [Sagore Dutta]] [2020]
6. Thyroidectomy leads to hoarseness of voice. [Sagore Dutta] [BMC][MSDMCH] [2020] [2019]
7. Right recurrent laryngeal nerve hook round right subclavian artery, whereas the left does round the ligamentum arteriosum. [SRIMS] [2020]
8. You have seen a male patient who is present to you with a discharging sinus on the anterior border of sternocleido mastoid muscle. On your anatomical knowledge of embryology explain the cause. [NRS][2020]
9. Incision of the neck bleed until the deep fascia is cut.[COMJNM] [2019]
10. Upper lip and related area is called dangerous area of face.[BSMC] [2019]
11. Scalp injury bleeds profusely but heal easily. [BSMC] [RGMC] [2019]
12. Thyroid swelling moves up and down with swallowing[MCK][KPC] [2019]
13. Recurrent laryngeal nerve pursues different course on each side. [MCK] [2019]
14. Cellulitis near philtrum, external nasal aperture and adjoining region of the face may be followed by cavernous sinus thrombosis.[MCK] [2019]
15. During thyroidectomy the superior thyroid arteries are ligated close to the gland and inferior thyroid arteries are ligated away from the gland? [MJNMCH] [2019]
16. Why maxillary air sinus is commonly accompanied by toothache?[MJNMCH] [2019]
17. Why loose, sub-aponeurotic tissue layer of the scalp is commonly called 'The dangerous are of scalp'. [MJNMCH] [2019]
18. Falling from a height causes loss of taste sensation at the anterior two-third of tongue.[RGKAR] [2019]
19. Infection of teeth causes referred pain in ear.[RGKAR] [2019]
20. Infection of tonsil causes pain in ear. [DHGMC] [RPHGMCH] [2019]
21. Surgical removal of palpebral part of lacrimal gland is considered equivalent to the functional removal of the gland.[DHGMCH] [2019]
22. A boy presents discharge of pus through ear following recurrent infection in throat.[DHGMC] [2019]
23. Epistaxis commonly occurs over the antero-inferior part of the nasal septum.[RGMC] [2019]
24. Injury to optical tract may cause "homonymous hemianopia"[RGMC] [2019]

25. Frey's syndrome.[BMC] [2019]
26. Discharging sinus of lateral aspect of neck[NRS] [2019]
27. How thyroid gland moves up and down with each deglutition. [NRS] [2019]
28. Why pain is felt in the ear in Caries of tooth? [NRS] [2019]
29. A patient of pituitary tumor suffers from bitemporal hemianopia. [MSDMCH] [2019]
30. Parotid gland surgery may lead to deviation of angle of mouth to opposite side. [RPHGMCH] [2019]
31. Proprioceptive sensation is spared but pain and touch sensation are involved in occlusion of anterior spinal artery.[RPHGMCH] [2019]
32. Left recurrent laryngeal nerve is a branch of left vagus in thorax where as right one is a branch of right vagus in neck.[KPC] [2019]
33. Parotid swelling is very painful.[IPGMER] [2019]
34. Facial artery is tortuous why. [ICARE] [2019]
35. Safety muscle of tongue which and why? [ICARE] [2019]

NEUROANATOMY

GROUP-A (15 MARKS EACH)

1. You have already learned the cerebrum and spinal cord in demonstration class. What is basic difference between these two viscera? Explain why the grey matter is outside in cerebrum and spinal cord. What are the principal sulci in the cerebrum? Define boundaries of different lobes. [2+3+2+5] [NRS] [2020]

2. One fine morning in December a young lady came to OPD with complaint of inability to close the eye, the angle of the mouth remains motionless during smiling, food gets accumulated in the vestibule of the mouth. The patient is diagnosed as L.M.N. type of paralysis due to involvement of one of the cranial nerves. Describe the affected cranial nerve under:

(a) Deep(nuclear origin) (b) Functional components (c) Course of nerves in the face (d) The site of the lesion of the nerve to produce above mentioned features (e) The site of lesion of the nerve when the features described above is associated with loss of taste sensation in anterior 2/3rd of the tongue. (3+5+5+1+1)[MJNMCH] [2019]

3. What is hydrocephalus? Describe the circulation and absorption of the cerebrospinal fluid. What are the usual sites of blockage of the circulatory route of cerebrospinal fluid? Enumerate the component structure of blood-CSF barrier. What is the usual site of lumbar puncture in adult and why? How a cerebello-medullary cistern is reached by a needle in the emergency operation theatre for doing cisternal puncture? (1+7+3+3+2+2)[MJNMCH][MSDMCH] [2019]

4. Enumerate the paired and unpaired dural venous sinuses. Write the cavernous sinus under the following headings- formation, relation, and communication. What is dangerous area of the face?(4+2+3+2+2+1)[DHGMC] [2019]

GROUP-B (10MARKS EACH)

1. Carotid sheath and ansa cervicalis [Malda] [2020]

2. Cross section of Medulla oblongata at the level of pyramidal decussations. [COMJNM] [2019]

3. Mention the location and formation of arterial circle of Willis with diaphragm. Briefly describe the paracentral lobule including its arterial supply and clinical importance. What is subclavian steal syndrome?(4+4+2) [BSMC] [2019]

4. Enumerate the ventricles of the brain. Write in brief the boundaries and contents of the third ventricles. What is hydrocephalus? (2+3+2)[MCK] [2019]

5. What is internal capsule? What are the different parts of it? Mention different fibers with suitable diagram passing through the different parts of internal capsule. Enumerate the different blood vessels that supply internal capsule. (1+1+4+4) [MJNMCH] [BMC] [2019]

6. Describe the base of the brain with a suitable diagram. [RGKAR] [2019]

7. A patient with Argyll Robertson pupil presents with persistence of accommodation reflex but loss of light reflex. Briefly describe the cause of this defect. What is blind spot? (4+2) [DHGMC] [2019]

8. Write boundary of third ventricle with labeled diagram. (5+1) [DHGMC] [2019]

9. Describe the relations of the cavernous sinus. What are the connections of cavernous sinus.(5+5) [RGMC] [2019]

Or, describe the boundaries and contents of cavernous sinus with a proper labeled diagram. Mention the communications of the sinus as well. (2+3+3+2) [RPHGMCH] [2019]

10. Name the structures presents on the floor of the fourth ventricle. How does cerebrospinal fluid exit from the fourth ventricle? (8+2) [RGMC] [2019]

11. What are the types of white fibers of brain? Why white fibers are inside and grey matters are outside the brain? How internal capsule are formed? Write in brief different parts of internal capsule with clinical applications and arterial supply. (2+2+3+3+3+2) [NRS] [2019]

GROUP-C (SHORT NOTES) (5 MARKS EACH)

1. Corpus callosum. [MMCH] [Sagore Dutta] [2020]

2. Broca's speech area. [Sagore Dutta] [2020]

3. Red nucleus of midbrain[COMJNM] [2019]

4. Internal capsule [MMCH] [2019]

5. Blood supply of spinal cord. [Sagore Dutta] [2019]

6. Central sulcus. [Sagore Dutta] [2019]

7. Histology of spinal cord.[MCK] [2019]

8. Lateral medullary syndrome[MCK] [2019]

9. Circle of Willis [RGKAR] [2019]

10. Para central lobule. [DHGMC] [2019]

11. Otic ganglion. [DHGMC] [2019]

12. Speech areas of brain. [RGMC] [2019]

13. Floor of fourth ventricle. [RPHGMCH] [2019]

GROUP-D (EXPLAIN WHY) (4 MARKS EACH)

1. Lumbar puncture is not done in patients with increased intracranial pressure.[COMJNM] [2019]
2. A lesion in the genu of internal capsule may produce diplopia. [BSMC] [2019]
3. Macular vision is often spared in occlusion of posterior cerebral artery. [MCK] [2019]

4. Why removal of cerebrospinal fluid by lumbar puncture may cause severe headache afterwards especially if the patient is not kept head down, supine position for about 30 minutes? [MJNMCH] [2019]
5. Lesion of charcot's artery causes hemiplegia. [RGKAR] [2019]
6. Abducent nervepalsyisacommonmanifestationofincreasedintra-cranialpressure. [DHGMC] [2019]
7. Macular vision is usually spared in lesion of posterior cerebral artery.[IPGMER] [BMC] [2019]

GENERAL ANATOMY, EMBRYOLOGY & GENETICS

GROUP-B (10 MARKS EACH)

1. Define long bone. Name the different parts of a young long bone. Describe the blood supply of long bone. [1+3+3] [DHGMCH] [2020]

2. Define epiphysis. Classify it with definition and examples. Define metaphysis. Discuss its features and clinical importance. (1+4+1+4) [RPHGMCH] [2019]

3. What do you mean by the term "Gastrulation"? Mention the derivatives of paraxial mesoderm. Describe the structure of tertiary chorionic villi of human placenta with a suitable labeled diagram. What do you mean by placenta previa? (1+2+3+3+1) [RPHGMCH] [2019]

GROUP-C (SHORT NOTES) (5 MARKS EACH)

1. Notochord. [SRIMS] [2020]

2. Blood supply of growing long bone. [SRIMS] [2020]

3. Sarcomere. [SRIMS] [2020]

4. Osteoblast, osteoclast both the cells play their own role in maturation of bone. [SRIMS] [2020]

5. Cadaver is our first teacher. [2020] [2019]

6. Down's syndrome. [DHGMCH] [2020]
7. Spurt muscle and shunt muscle. [DHGMCH] [2020]
8. Derivatives of secondary mesoderm. [DHGMCH] [2020]
9. Duties / responsibilities of a doctor. [DHGMCH] [SRIMS] [2020] [2019]
10. Transitional epithelium. [DHGMCH] [MMCH] [2020] [2019]
11. Blastocyst. [DHGMCH] [MMCH] [2020] [2019]
12. Barriers of therapeutic communication. [SRIMS] [2020]
13. Klienfelter's syndrome [IQ City] [2020]
14. Turner syndrome [NRS] [2020]
15. Doctor patient relationship. [ICARE] [2020]
16. Embalming.[MMCH] [2019]
17. Neural crest cell.[MMCH] [2019]
18. I.M.G.[MMCH] [2019]
19. Tertiary villi.[MMCH] [2019]
20. Handling a wet specimen [BSMC] [2019]
21. Role of a 1st year medical student to motivate people for cadaver donation.[BSMC] [MCK][BMC] [2019]
22. The process of fertilization under heading –i) steps ii)results [SRIMS] [2019]
23. Haversian system. [MCK] [2019]
24. Cervical sinus.[MCK] [2019]
25. Doctor-patient relationship. [RGKAR] [2019]
26. Folding of embryo. [NRS] [2019]
27. Epiphysis.[MSDMCH] [2019]
28. Capacitation. [MSDMCH] [2019]
29. Compound epithelium. [MSDMCH] [RPHGMCH] [2019]
30. Mutation–definition, types with example in each type. [RPHGMCH] [2019]

GROUP-D (EXPLAIN WHY) (4 MARKS EACH)

1. In karyotyping we use colchicines to the culture vial at the end of the 3rd day. [MMCH] [2020]
2. No barr body is present in turner's syndrome.[Purulia] [2020]
3. Monozygotic and dizygotic twins are not identical [IQ City] [2020]
4. Clavicle is a modified long bone.[SRIMS] [2019]
5. How the blood clot from pelvic veins after child birth can reach the intracranial dural venous sinus without passing through heart and lungs? [MJNMCH] [2019]
6. Veins are also known as capacitance vessels.[RPHGMCH] [2019]
7. The 2nd week of development is known as week of two S – embryologically explain.[IPGMER] [2019]
8. In fibula, law of union of epiphysis is violated. [IPGMER] [2019]
9. The nerve supply of tongue is different inanterior2/3rd and posterior 1/3rd - explain embryologically [IPGMER] [2019]

PHYSIOLOGY

GENERAL AND NERVE MUSCLE PHYSIOLOGY

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

1.Name the different modes of transport across the cell membrane. Explain the mechanism of action of Na^+-K^+ ATPase pump. What is positive feedback? Give an example of positive feedback. Explain how ORS is used to counter Na^+ and H_2O loss in diarrhea. [2+5+2+2+4] [MMC][2020]

2.Discuss the different types of membrane transport acting across the cell membrane in detail. Write comments on 'Apoptosis' and 'Necrosis'. (10+5) [SRIMS] [2019]

3.Describe with diagrams the molecular basis of muscle contraction. Differentiate the roles ofcalcium in skeletal and cardiac muscle contraction. Add a note on rigor mortis. (7+5+3) [KPC] [2019]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

1.With labeled diagrams explain the differences between action potential of skeletal and ventricular muscles. Comment on the refractory periods seen in both types of action potential. [6+4] [Purulia] [2020]

2.What do you mean by sarcotubular system? Enumerate the structural and functional differences between skeletal and smooth muscle? [3+4+3] [BSMC] [2020]

3.Define action potential. Write about the ionic basis of action potential of a nerve with a properdiagram. How action potential propagated along non-myelinated and myelinated nerve fibers? (2+4+4)[RPHGMCH] [BSMC] [COMJNM] [2020][2019]

4.Write sequence of events Neuro-muscular transmission. What is 'Myasthenia gravis'? (7+3)[SRIMS] [RGMC] [2020][2019]

5.What is resting membrane potential? Describe the phases and ionic basis of generation of actionpotential in nerve fibers. (2+2+6) [ESIC Joka] [2019]

6.What is RMP? Enumerate the factors responsible for generation of the RMP. Role of Gibbs-Donnan's equilibrium in RMP. Write RMP of various tissues (Skeletal muscle, Nerve, Heart). (1+2+4+3) [MMCH] [2019]

7.Define Homeostasis. What are the mechanisms regulating homeostasis? (2+8) [SRIMS] [2019]

8.Write in brief about the molecular basis of skeletal muscle contraction and relaxation. What isrigor mortis? (8+2) [RPHGMCH] [2019]

SHORT NOTES (5 MARKS EACH)

1.Nernst Equation. [MMCH][2020]

2.Donnan effect. [MSDMCH][2020]

3.Active transport. [MSDMCH] [BSMC] [2020]

4.Molecular basis of muscle constraction (only flow chart). [MSDMCH][2020]

5.Motor unit. [MSDMCH][2020]

6.Myasthenia Gravis. [MSDMCH][2020]

7.Gap junction. [SRIMS] [2020]

8.Secondary active transport. [RGMC] [2020]

9.Differences between 'myasthenia gravis' and 'Lambert Eton Myasthenic syndrome'. [ICARE][2020]

10. Action Potential [BMC] [2019]

11. Muscle Spindle [BSMC] [2019]

12. Receptor potential [BMC] [2019]

EXPLAIN WHY (4 MARKS EACH)

1.Potassium ion is the most important determinant maintaining the RMP of a cell. [Purulia] [2020]

2.Vasodilation occurs in blood vessels of skeletal muscles in severe exercise. [Sagore Dutta][2020]

3.Skeletal muscle relaxation is an active process. [Sagore Dutta] [RGMCH] [2020]

4.Rigor mortis occurs after death. [SRIMS][2020]

5.Adenosine triphosphate (ATP) helps in contraction and relaxation of muscles. [ESIC Joka] [2019]

6.Hypocalcaemia increases excitability of nerves. [ESIC Joka] [2019]

7.Relaxation of muscle is an active process. [ESIC Joka] [JIMSH] [2019]

8.Role of Calcium in excitation-contraction coupling. [IPGMER] [2019]

HAEMATOLOGY

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

1.Mention briefly the factors necessary for erythropoiesis. What is erythroblastosis fetalis and outline the prevention and treatment for erythroblastosis fetalis. [5+5] [Purulia] [2020]

2.Enumerate the steps of Hemostasis. Mention the role of platelets in hemostasis. Schematically describe the intrinsic pathway of blood coagulation and enumerate the clotting factors. Discuss the anti clotting mechanisms of our body. Write briefly about the causes &implications of Vitamin K deficiency. [3+3+3+3+3] [BSMC] [2020]

3.Enumerate the functions of platelet. What is Haemostasis? Write down the mechanism of haemostasis. Draw a schematic diagram of clotting mechanism in detail. Write down the physiological significance of fibrinolytic system. State the role of Aspirin & Vitamin K in coagulation. [2+1+2+5+2+3] [RGMC] [2020]

4.Define erythropoiesis. List and describe the stages of erythropoiesis with suitable diagram. Explainthe factors affecting erythropoiesis. (1+2+8+4) [ESIC Joka] [2019]

5.Mention steps of hemostasis and coagulation cascade. Classify haemorrhagic disorders. (6+7+2)[MJNMCH] [2019]

6.What is Haemostasis? What are the stages of Haemostasis? Explain the role of platelets in Haemostasis. Justify the role of Streptokinase in treatment of Acute Myocardial Infarction. What is Von Willebrand's disease? (1+2+5+5+2) [MMCH] [2019]

7.Define Hemostasis. Enumerate different coagulation factors. Briefly outline the events of coagulation. Justify the role of aspirin for the prevention of stroke. (2+2+8+3) [RGKAR] [2019]

8.Define haemopoiesis. Describe the steps of erythropoiesis. Mention the various factors that regulate erythropoiesis. Enumerate the functions of blood. (2+7+3+3) [RPHGMCH] [2019]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

1. What are the different effector cells off innate immunity? Write briefly about the different types of immunoglobulins. [5+5] [Purulia] [2020]

2. Describe the role of neutrophils in defence mechanism. What is CRP and write down its clinical significance. [7+3] [MMC][2020]

3. A 55 year old chronic alcoholic patient was brought to the ER with excessive bleeding from a trivial cut injury on his right foot. Name the clotting factors might be indicated in this case. With a flow-chart describe the steps of secondary haemostasis. Very briefly narrate the three basic tests to diagnose a clotting disorder. [2+5+3] [ICARE][2020]

SHORT NOTES (5 MARKS EACH)

1. Erythropoietin. [MMCH][SRIMS][2020]

2. Rh incompatibility and its clinical significance. [MSDMCH][2020]

3. Anticlotting system. [MSDMCH][2020]

4. Cell mediated immunity. [BSMC] [2020]

5. Write briefly the pathophysiological basis of hemolytic disease of new born? How can it be prevented? What is Kernicterus? [3+1+1] [COMJNM] [2020]

6. Components of innate immunity. [RGMC] [2020]

7. What are the 'antigen presenting cells'? Briefly describe humoral mediated immunity. [ICARE][2020]

8. Bombay blood group [MMC] [2019]

EXPLAIN WHY (4 MARKS EACH)

1.Venous blood has higher hematocrit than arterial blood. [Purulia] [SRIMS] [2020] [2019]

2.RBCs are more fragile in venous blood than arterial blood. [MMCH][2020]

3.Neutrophils are the first lines of defence – explain. [MSDMCH][2020]

4.Why blood does not clot inside the vessels. [SRIMS] [2020]

5.Oral Vitamin B_{12} administration is not useful in the treatment of pernicious anemia. [RGMC] [2020]

6.Why the fetus does not evoke any immunological response in the mother? [RGMC] [2020]

7.Vitamin B12 and folate deficiency lead to macrocytic anemia. [MJN MEDICAL COLLEGE]

8.Blood becomes alkaline after meal. [SRIMS]

RESPIRATORY SYSTEM

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

1.Define respiration. Describe the neural regulation of respiration. Briefly discuss about the factors affecting the respiratory centers. [1+7+7] [Purulia] [2020]

2.List the muscles of respiration. Describe the intrapulmonary and intrapleural pressure changes during respiration. Explain "Hysteresis Loop". What is Dyspnoeic Index? [4+4+4+3] [MMCH][2020]

3.What is hypoxia? Discuss the different types of hypoxia in detail. [JIMSH][2020]

4.What is surfactant? How is it produced? Name the factors affecting it. What are the functions and physiological significance of surfactant? What is hyaline membrane disease? [1+1+4+7+3] [COMJNM] [2020]

5.With a neat diagram briefly describe the static, specific and dynamic compliances of the lungs. Enlist the clinical condition causing reduction and increase in compliance of the lungs. [4+2+4+3+2][ICARE][2020]

6.Classify and explain baroreceptors. Describe the role of baroreceptors in maintaining the blood pressure. Add a note on "Hypertension". (4+7+4) [ESIC Joka] [2019]

7.Give a brief account on Chemical Regulation of respiration. Explain changes in respiratory system during exercise. (5+3=8) [IQ City] 2019]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

1. Discuss the effects of exercise on respiration. [JIMSH][2020]

2. Explain the transport of gases in blood. What is Hering-Breuer reflex? [SRIMS][2020]

3. What are different areas of brain involved in regulation of human respiration? Explain the chemical control of breathing what is pulmonary chemoreflex? [2+6+2] [MCK] [2020]

4. List the hazards of deep-sea diving. Explain the mechanism of decompression sickness. How the hazards can be prevented? [2+6+2] [MCK] [2020]

5. Draw a well labeled diagram of O_2-Hb dissociation curve. Explain P_{50}. List the factors shifting O_2-Hbdissociation curve to left and right. (2+4+2+2) [ESIC Joka] [2019]

6. Describe the neural centers of respiration. How do they act in eupnoea? What is apneustic breathing? (4+4+2) [JIMSH] [2019]

7. Define Hypoxia. Describe the different types of hypoxia. What is the role of oxygen therapy indifferent types of hypoxia? (1+7+2) [NRS] [2019]

8. Explain O_2-Hb dissociation curve with diagram. Enumerate causes for the left shift of O_2 curve. (3+1=4) [IQ City] [2019]

9. What is pulmonary surfactant? Explain the role of pulmonary surfactant in the maintenance ofstability of alveoli. (3+7) [RGKAR] [2019]

10. Explain the sequential changes in inflammation. [MJNMCH] [2019]

11. What is hypoxia? Enumerate the different types of hypoxia with example. Describe thecompensatory mechanism in high altitude acclimatization. (1+4+5) [MSDMCH] [2019]

12. What are the different types of chemoreceptors? Explain chemo regulation of respiration in healthy adults. Why 100% oxygen is not given while treating a patient of chronic obstructive airwaydisease? (3+5+2) [IPGMER] [2019]

13. Describe mechanisms of respiration. What are the functions of surfactant? (7+3) [SRIMS] [2019]

14. Discuss the chemical regulation of respiration. What is Cheyne-Stoke's breathing? (7+3) [RPHGMCH] [2019]

SHORT NOTES (5 MARKS EACH)

1.Periodic breathing. [Purulia] [2020]

2.Closing volume and closing capacity. [Purulia] [2020]

3.Surfactant and its clinical importance. [RGKAR] [RGMC] [2020]

4.Timed Vital Capacity. [MMCH] [COMJNM] [2020]

5.O2-Hb dissociation curve[SRIMS] [Sagore Dutta][2020][2019]

6.Non-respiratory functions of heart. [SRIMS][2020]

7.Physio-clinical significance of oxygen toxicity. [COMJNM] [2020]

8.Ventilation-Perfusion ratio [BMC] [NRS][2020][2019]

9.Hypoxic Hypoxia [IQ City] [2019]

10. Hypoxia [BMC]

11. Compensated respiratory acidosis [DHGMCH]

12. Baroreceptor reflex [MSDMCH]

EXPLAIN WHY (4 MARKS EACH)

1.Basal part of the lung is better ventilated compared to apex.[MSDMCH] [Purulia] [RGMC] [2020][2019]

2.Increase in pulmonary ventilation continues even after exercise is over. [MMC][2020]

3.Cyanosis does not occur in severe anemia. [Sagore Dutta] [ICARE][2020]

4.Exposure to mild cold may produce cyanosis. [SRIMS][2020]

5.Respiratory chemoreceptors are not stimulated in anemia. [COMJNM] [2020]

6.Increase in nerve impulse does not increase ventilation to any extent in normal individuals until Po_2 is less than 60 mmHg. [MCK] [ICARE] [2020]

7.Cyanide poisoning causes high PO_2 in venous blood. [ESIC Joka] [2019]

8.Intrapleural pressure is negative. [RPHGMCH] [2019]

9.Tubercular lesions are seen in the apical portion of lung. [IQ City] [2019]

10. Alveoli are kept dry. [IQ City] [2019]

CARDIOVASCULAR SYSTEM

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

1. With the help of a proper diagram explain the genesis of different waves in ECG. Enumerate the notable segments & intervals and their diagnostic importance. How do you identify atrial fibrillation in ECG? [7+6+2] [Purulia] [2020]

2.What is systematic arterial blood pressure? How blood pressure is regulated? What is hypertension? What is vasomotor reversal of dale? [2+10+2+1] [Sagore Dutta][2020]

3.Enumerate the different phases of Fast action potential with ionic basis. What do you mean by Preload and Afterload? Add a note on Staircase phenomenon. [6+4+5] [Sagore Dutta][2020]

4.Discuss briefly cardiovascular reflexes. [Sagore Dutta][2020]

5.Define ECG. Write Einthoven's law. What is PR interval and its significance? What are the different types of leads and their placements? [2+3+4+6] [Sagore Dutta][2020]

6.What is cardiac output? Define cardiac index and ejection fraction. Discuss briefly the factors controlling cardiac output. [JIMSH][2020]

7.Define circulatory shock. Enumerate different types of shock with examples. Briefly describe the hemodynamic events occurring in different stages of hypovolemic shock. What is the role of Glucocorticoid in the treatment of shock? [2+3+8+2] [COMJNM] [2020]

8.Define cardiac output. Enumerate the factors controlling venous return. Explain how these factors control venous return. Explain Frank Starling law with a suitable diagram. What is ejection fraction? [2+2+4+4+3][MCK][2020]

9.Define erythropoiesis. List and describe the stages of erythropoiesis with suitable diagram. Explainthe factors affecting erythropoiesis. (1+2+8+4) [ESIC Joka][2019]

10. Define systolic blood pressure, diastolic blood pressure, mean arterial pressure. Describe the role of hormones in control of BP, what is white-coat hypertension? (2+2+2+7+2) [JIMSH][2019]

11. Define cardiac output. Describe the factors which regulate cardiac output. How is cardiac outputregulated during exercise? Describe the baroreceptor reflex. (2+7+3+3) [NRS] [2019]

12. Define immunity. Classify different types of immunity. Describe mechanism of Humoral Immunity.(1+3+4=8) [IQ City] [2019]

13. What is ECG? How to determine heart rate from ECG? In atrial fibrillation and how will you determine heart rate? How augmentation does occur in augmented leads? Draw an ECG showingWPW syndrome. (2+2+3+5+3) [MMCH] [2019]

14. Define blood pressure. Enlist the determinant of Blood Pressure. What is the role of Baroreceptorreflex in short term regulation of BP? Name any four hormonal factors involved in regulation of BP. Describe the effects of exercise on arterial BP. (2+3+5+2+3) [IPGMER] [2019]

15. Define immunity. Explain the different types of immunity in detail. What do you mean by 'NaturalKiller Cells'? (2+10+3) [SRIMS] [2019]

16. What is normal heart rate? Describe its regulation. What is Sinus Arrythmia? (3+9+3) [RPHGMCH] [2019]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

1.Name the junctional tissues of heart. Describe how cardiac impulse originates and spreads along the whole of the heart? [2+8][MMCH] [NRS] [2020]

2.What is cardiac output? Enumerate the factors regulating cardiac output. Briefly mention themethods of measurement of cardiac output. (2+5+3) [Purulia] [MSDMCH] [Sagore Dutta][2020][2019]

3.Describe the factors affecting heart rate. Enumerate the causes of 'Tachycardia'. (7+3) [SRIMS] [JIMSH][2020]

4.Define cardiac cycle. Describe various events of cardiac cycle with pressure and volume changes. [SRIMS][2020]

5.Define cardiac cycle and what are the phases of cardiac cycle? Draw Wigger's diagram and describe changes in aortic pressure, left ventricular pressure and ECG waves during cardiac cycle. What are the effects of systolic and diastolic dysfunction on pressure-volume loop of the left ventricle? [1+3+2+2][RPHGMCH][2020]

6.At a BPHC a 50 year old male patient came with history of breathlessness for last few days. His JVP was found to be raised. What is JVP? Draw a labeled diagram to explain its waves. What does a raised JVP signify? [2+6+2] [ICARE][2020]

7.What are the baroreceptors? Mention in brief their mode of operation to control BP with a help of a flowchart. [IQ City] [2020]

8.Explain basis of pacemaker potential. Describe the Effect of sympathetic stimulation on pacemaker potential. (3+1=4) [IQ City] [2019]

9.Explain different sequential changes in inflammation. [MJNMCH] [2019]

10. What is cardiac cycle? Describe the different stages of cardiac cycle. Differentiate between 1st and2nd heart sound. (2+6+2) [BSMC] [2019]

11. What is innate immunity? Write the steps of actions of Neutrophils. What is "Cytokine storm"?(2+6+2) [MMCH] [2019]

12. Describe the different phases of cardiac cycle. Add a note on heart sounds. (7+3) [KPC] [2019]

SHORT NOTES (5 MARKS EACH)

1.Second heart sound. [Purulia] [2020]

2. Pressure-volume loop of left ventricle. [Purulia] [IQ City] [2020]

3.Sinus arrhythmia. [Purulia] [2020]

4.Positive ionotropic factors. [MMCH][2020]

5.Heart sounds. [MMC][2020]

6.Post extrasystolic potentiation. [JIMSH][2020]

7.Pacemaker tissues of heart. [SRIMS][2020]

8.Vasomotor reversal of dale. [JIMSH][2020]

9.Buffer nerves of heart. [CNMC] [2020]

10. Ionic events occurring in Slow and Fast action potential of cardiac tissue. [COMJNM] [2020]

11. Autorhythmicity of heart. [MCK] [2020]

12. Cardiogenic shock. [MCK] [2020]

13. 2nd degree heart block. [IQ City] [2020]

14. Iron deficiency anemia [ESIC Joka] [2019]

15. Pacemaker potential [JIMSH] [2019]

16. Innate immunity [BMC] [2019]

17. Circulatory changes after birth [DHGMC] [2019]

18. Disseminated intravascular coagulation [IPGMER] [2019]

EXPLAIN WHY (4 MARKS EACH)

1.Digitalis improves heart failure / Digitalis increases the force of contraction of cardiac muscle. [Purulia] [COMJNM] [ICARE][2020]

2.A premature heart beat is usually followed by a stronger beat. [MMCH][2020]

3.Cardiac muscle cannot be totalized. [IQCITY] [Purulia] [2020]

4.Second degree heart block may not always require a pacemaker. [Purulia] [2020]

5.Blood pressure usually has an inverse relation with heart rate. [JIMSH][2020]

6.Meningitis patients show decreased heart rate. [JIMSH][2020]

7.Prolonged standing may cause syncope. [JIMSH][2020]

8.SA node is referred as the primary pacemaker of the heart.[SRIMS][2020]

9.Increase in BP occurs in intracranial hypertension. [DHGMC][2020]

10. Myocardial ischemia may be precipitated in tachycardia. [DHGMC][2020]

11. Nodal delay is beneficial. [MCK] [NRS][2020]

12. Subendocardial part of left ventricle is the most common site of myocardial infarction and especially vulnerable to ischemia. [MCK] [NRS] [2020]

13. Persistent hyperventilation may lead to tetany. [NRS][2020]

14. Concentric hypertrophy of the ventricles normalizes ventricular wall stress in pressure overload. [RPHGMCH] [2020]

15. Aneurysms are prone to rupture. [RPHGMCH] [2020]

16. Elevation of ST segment in ECG is seen in acute MI. [ICARE][2020]

17. Capillaries are also called as exchange vessels. [ESIC Joka] [2019]

18. Left ventricle gets majority of its blood supply during diastole. [NRS] [2019]

19. Aspirin in low dose is given to prevent thrombosis. [IQ City] IPGMER] [2019]

20. Vitamin B12 and folate deficiency lead to macrocytic anemia. [MJNMCH] [2019]

21. Cannon wave in JVP found in complete heart block. [MMCH] [2019]

22. Iron supplement is not given in Thalassemia, though the patient is anemic. [MMCH] [2019]

23. Anemia may result due to chronic renal failure. [SRIMS] [2019]

24. T-wave represents ventricular repolarisation but it is the same direction as the QRS in lead II ofECG. [BMC] [2019]

25. Cardiac muscles do not get fatigued. [RPHGMCH] [2019]

26. Low dose of Aspirin is useful to patients with Coronary Heart disease.[RPHGMCH] [2019]

27. In a Rh-negative mother carrying Rh-positive foetus, the first child is usually normal. [RPHGMCH] [2019]

DIGESTIVE SYSTEM

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

1. Describe with a figure the mechanism of HCL secretion in stomach. Enumerate different cell types present in the glands of stomach and also mention about the secretions from each cell type. Mention the patho-physiological basis of peptic ulcer formation & outline its management. [5+3+7] [Purulia] [COMJNM] [RPHGMCH] [2020]

2. Write the composition, phases and regulation of Gastric juice secretion. Add a note on 'Peptic ulcer'. (10+5) [SRIMS][2019]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

1.What is gastrin? Name the different forms of gastrin. Explain the function of gastrin. Enumerate the factors controlling its secretion. What is Zollinger Ellison Syndrome? [1+2+3+2+2][MMCH][2020]

2.Write down important constituents of bile. How does bile salt help in the absorption of lipid? Discus the importance of Enter-Hepatic circulation with suitable diagram. Define jaundice. [2+3+3+2] [BSMC] [2020]

3.A 39 years old lady attended the Medicine OPD with nausea, loss of appetite and weakness. She was found to have icteric sclera and deep tenderness at her right hypochondrium. Briefly describe the three basic types of jaundice. How could you differentiate them by biochemical parameters? [5+5] [ICARE][2020]

4.List and describe the mechanisms that help in protecting the stomach against auto digestion bygastric acid and pepsin. (2+8) [ESIC Joka] [2019]

SHORT NOTES (5 MARKS EACH)

1.Gastric emptying. [Sagore Dutta][2020]

2.GI Movements. [MJNMCH] [2020]

3.Migrating Motor Complex. [MSDMCH] [RGMC] [2020]

4.BER. [RGMC] [2020]

5.Regulation of gastric acid secretion. [MSDMCH][2020]

6.Enterohepatic circulation. [MSDMCH][2020]

7.Gastrin. [MSDMCH][2020]

8.Gastric mucosal barrier. [SRIMS] [RPHGMCH] [2020]

9.Proton pump inhibitors are used in peptic ulcer. [NRS][2020]

10. Dietary fibers [ESIC Joka] [2019]

11. Mechanism of secretion and functions of Bile juice. [IPGMER] [2019]

12. Mechanism of HCl secretion [RPHGMCH] [2019]

EXPLAIN WHY (4 MARKS EACH)

1.Partial gastrectomy will lead to iron deficiency anemia. [MMC][2020]

2.Pancreas is not autodigested. [MMCH] [Sagore Dutta] [COMJNM] [2020]

3.Pernicious anemia may occur after total gastrectomy. [Purulia][2020]

4.Proton pump inhibitors completely stop gastric HCL secretion. [MJNMCH] [2020]

5.Prolonged use of NSAIDs may lead to peptic ulcer. [BSMC] [2020]

6.Steatorrhea occurs in obstructive jaundice. [RGMC] [2020]

7.Clay colored stool occurs in obstructive jaundice. [NRS][2020]

8.Absence of bile salts in the small intestine may cause steatorrhoea. [ESIC Joka] [2019]

9.Acute hepatitis may cause dimorphic jaundice.[MJNMCH] [2019]

10. Diabetic patients complain of polyphagia and polydipsia. [SRIMS] [2019]

11. Polyphagia occurs in diabetes mellitus. [RPHGMCH] [2019]

EXCRETORY SYSTEM

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

1.What is Glomerular filtration rate (GFR)? How to determine and measure GFR? What are thefactors influencing GFR? How GFR is autoregulated? (1+3+5+6)[Purulia][COMJNM][BMC] [IQ City] [2020][2019]

2.What is glomerular filtration rate? What is filtration fraction and what is the value? How GFR is maintained with wide fluctuations of mean systematic arterial pressure? Mention the parameters on which GFR depends. [2+3+7+3] [Purulia] [2020]

3.Draw a neat, labeled diagram of nephron mentioning the % of sodium, Glucose, Water and other important solutes reabsorbed or secreted from different parts of renal tubule. Explain the physiological basis of action of different types of diuretics. [2+3+6+4] [MCK] [2020]

4. With clear diagrams briefly describe the renal handling of sodium at various segments of the nephron. Mention the role of aldosterone in it; with special mention about 'mineralocorticoid escape' phenomenon. How does Furosemide help in reducing water load from our body? [8+4+3] [ICARE][2020]

5.Define renal failure. Describe the types, features and treatment of renal failure. What is 'Glomerular Filtration Rate'? (2+10+3) [SRIMS] [2019]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

1.What do you mean by renal threshold for glucose? With the help of a diagram explain the 'splay' phenomenon. [3+7] [RGKAR] [2020]

2.Write briefly the reabsorption of water in different parts of the nephron. Describe the autoregulatory mechanism in renal blood flow.[7+3][JIMSH] [GIMSH][2020][2019]

3.What are tubuloglomerular feedback and glomerulotubular balance? Describe their mechanism. [JIMSH][2020]

4.Define renal clearance. How it can be measured. (Mention principles and methods). [2+8] [CNMC] [2020]

5.Define GFR. Describe the factors regulating GFR. (3+7) [KPC, RGKAR] [2019]

6.Describe the role of loop of Henle and vasa recta in kidney function. (2+2+6) [COMJNM] [2019]

7.Describe the mechanism of acidification of urine. What do you mean by juxtaglomerularapparatus? (6+4) [MCK] [2019]

8.What is cystometrogram? What are the different phases of it? State 2 reasons for the flatness ofthe plateau phase. With the help of a diagram, explain how deafferentation affects voiding reflex. Discuss the source of the abnormal constituents of urine. (1+1+2+3+3) [BSMC] [2019]

9.How GFR is measured experimentally? Mention the factors which control GFR. (3+4) [DHGMC] [2019]

10. Write the modification of Starling's Equation as applicable in Glomerular Capillary System and explain the mechanism of formation of Glomerular Filtrate in the Bowman's capsule. State the principle ofmeasurement of GFR. Explain how an obstructive uropathy affects glomerular filtration. (3+3+2+2)[IPGMER] [2019]

11. Describe how the countercurrent mechanism in the kidney acts to produce hypertonic or hypotonic urine. Describe micturition reflex. (7+3) [BMC] [2019]

12. What is Counter current system in kidneys? Describe its role in concentrating and dilating of urine.(2+8) [RPHGMCH] [2019]

13. Describe the different mechanisms of Na^+ reabsorption from the Proximal Convoluted Tubules(PCT) with relevant labeled diagrams. Explain the mechanism of 'splay' phenomenon seen during Glucose reabsorption. (7+3) [RGMC] [2019]

SHORT NOTES (5 MARKS EACH)

1.Tubuloglomerular feedback. [Purulia][NBMC][2020]

2.Juxta-Glomerular Apparatus. [Purulia] [GIMSH] [IQ City] [2020]

3.Atonic bladder[MCK] [2020]

4.What is limiting pH? Which part of the renal tubule mainly determines urine pH and how? [1+4] [RPHGMCH] [2020]

5.Splay phenomenon and transport maximum. [RPHGMCH] [BMC] [2020]

6.Counter current exchanger system. [Malda] [2020]

7.Facultative water reabsorption. [NRS][2020]

8.RAAS [JIMSH] [2019]

9.Pathophysiological basis of the clinical features of Diabetic Ketoacidosis. [RGMC] [2019]

EXPLAIN WHY (4 MARKS EACH)

1.Urine becomes alkaline after meal. [Purulia] [SRIMS] [ICARE] [2020]

2.Juxtamedullary nephron differs from cortical nephron. [Purulia][2020]

3.Explain why there is absence of backflow of urine from the urinary bladder to the kidney during bladder filling. [GIMSH][2020]

4.Renal threshold differs from calculated value. [JIMSH] [MCK] [IQ City] [2020]

5.Glomerular capillary pressure is higher than other capillary pressures in the body. [SRIMS][2020]

6.Glomerulonephritis patients suffer from albuminuria. [MCK] [2020]

7.Alkalosis leads to features of hypocalcaemia. [RPHGMCH] [2020]

8.Secondary hyperparathyroidism in chronic renal failure. [RPHGMCH] [2020]

9.In normal person amount of protein in urine is less than 100 mg/day. [Malda] [2020]

10. Despite a high glomerular filtration rate (180 liters/day), the urinary output remains markedly low.[MCK]

11. Hyponatremia occurs in diabetic ketoacidosis. [BSMC] [2019]

12. Water absorption in collecting duct is hormone dependent. [MSDMCH] [2019]

13. Edema occurs in hypoproteinaemia. [BMC] [2019]

14. Principle of clearance is used to measure GFR. [RPHGMCH] [2019]

15. Change in intravesical pressure is negligible during phase Ib of Cystometrogram. [RGMC] [2019]

ENDOCRINE SYSTEM

LONG ANSWER TYPE QUESTIONS (15 marks each)

1.Outline the steps of thyroid hormone synthesis. What is Woll-Chaikoff effect? What is cretinism & mention its features. [7+4+4][Purulia][2020]

2.What are the hormones secreted by adrenal cortex? What are the mechanisms of action of corticosteroids? Discuss the physiological effects of Glucocorticoid on different systems of body. [1+1+1+1.5+1.5+9] [Purulia] [2020]

3.Name the hormones of islets of langerhans. Mechanism of action of insulin. State the function of insulin. What are the differences between Diabetes mellitus and Diabetes insipidus ?[2+3+7+3] [GIMSH] [BSMC] [2020]

4.Name the hormones synthesized by the thyroid gland. Discuss the secretion of thyroid gland is regulated. Describe in brief the features of hypothyroidism and explain their physiological basis. Whygoiter is common in sub Himalayan region? Write a note on thyroid function test? (2+3+6+1+3) [BSMC] [Malda] [2020] [2019]

5.How insulin secretion is regulated? What are the metabolic actions of insulin? How life threatening hyperkalaemia is managed hormonally? [5+8+2] [NRS][2020]

6.What do you mean by hypothalamo-pituitary endocrine gland axis? Explain positive feedback withtwo examples. Name the hormones secreted by the pituitary gland. What are somatomedins? What is acromegaly? (3+3+5+2+2) [MCK] [2020]

7.Enumerate hormones secreted by Thyroid gland. Describe the steps of thyroid hormone synthesis. What are the metabolic functions of thyroid hormones? What is Grave's disease? (2+6+4+3)[MSDMCH] [GIMSH][2020]

8.Enumerate the hormones secreted by endocrine pancreas. Describe the actions of insulin. Add anote on "Diabetes Mellitus". (2+8+5) [COMJNM] [2019]

9.Enumerate the functions of Calcium in our body. Write briefly about the role of PTH in maintainingcalcium homeostasis. (5+10) [KPC] [2019]

10. Name the various layer of Adrenal cortex and hormones they secrete. Write in brief the actions of glucocorticoids. What is Cushing's syndrome? (3+7+5) [RPHGMCH] [2019]

11. Enumerate the different layers of the adrenal cortex and the hormones produced by them. Describe with a proper flowchart the steps in the biosynthesis of the adrenocortical hormones. Describe the physiological actions of glucocorticoids. Discuss in brief the different clinical features ofCushing's syndrome. (3+5+5+2) [RGMC] [2019]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

1.Classify steroid hormones and mention their sources. Outline the biosynthetic pathway of adrenocortical and gonadal steroids. Outline the slow genomic action of steroids.[2+5+3] [MJNMCH] [2020]

2.Enlist the principal adrenocortical hormones in adult humans. Briefly describe the regulation of aldosterone secretion. [3+7] [RGKAR] [2020]

3.Enumerate the hormones secreted by anterior pituitary gland. Describe mechanism of action ofgrowth hormone. Describe the features seen in hyper secretion of Growth hormone. (3+2+5) [RGKAR] [Purulia] [2020]

4. Discuss briefly how blood calcium level is maintained with special reference to PTH, Calcitonin, Vitamin D. [GIMSH][2020]

5.What are the target tissues of insulin? Mention the physiological/metabolic effects of insulin in those tissues. What is diabetic ketoacidosis? (1+5+2) [DHGMC][2020]

6.Enumerate the hormones that control calcium concentration in our body. Delineate the steps of Vitamin D synthesis and its action on GI tract. Outline the mechanism of action of Parathyroid hormone on bone cells. Explain the pathophysiology of non-pitting edema in hypothyroidism. [1+3+3+1][RPHGMCH][2020]

7.Briefly describe synthesis and physiological action of thyroid hormone. Enumerate the clinicalfeatures of hypothyroidism. What is Wolff-Chaikoff effect? (3+3+2+2) [COMJNM] [2019]

8.Explain why steroid treatment should be slowly tapered off. Explain why diabetic patients complain of polyphagia and polydipsia. (5+5) [COMJNM] [2019]

9.Explain the actions of cortisol. [MJNMCH] [2019]

10. Mention different steps of biosynthesis of T3. [MJNMCH] [2019]

11. Describe briefly the synthesis of Thyroid hormones. Which step of synthesis is TSH independent? Is there any difference between hyperthyroidism and Thyrotoxicosis? Describe pathophysiology andclinical features of Grave's disease. (5+1+1+3) [IPGMER] [2019]

12. Describe the functions of Growth Hormone. Add a note on 'Gigantism'. (7+3) [SRIMS] [2019]

13. Describe the mechanism of action of Growth Hormone. Add a note on 'Acromegaly'. (7+3) [BMC] [2019]

SHORT NOTES (5 MARKS EACH)

1.Cushing syndrome[BSMCH] [RGKAR][NBMC][2020]

2.Short stature (endocrinal) [CNMC] [2020]

3.Graves's disease. [SRIMS][2020]

4.Diabetes insipidus. [DHGMC][2020]

5.Mechanism of action of Insulin. [BMC] [2020]

6.Calcitonin [Malda] [2020]

7.Precocious puberty may occur in a male child suffering from congenital adrenal hyperplasia. [NRS][2020]

8.LH surge [JIMSH] [2019]

9.Paralysis agitans [COMJNM] [2019]

10. Theories of ageing [DHGMC] [2019]

11. Secretin [MSDMCH] [2019]

EXPLAIN WHY (4 MARKS EACH)

1.Beta blocker is used in hyperthyroidism. [Purulia][2020]

2.Diabetic individuals show hyperphagia. [NBMC][2020]

3.Tachycardia is a feature of thyrotoxicosis. [NBMC][2020]

4.Unilateral renal artery stenosis leads to hypertension. [NBMC][2020]

5.Polydipsia, polyphagia and polyuria are cardinal symptoms of Diabetic Mellitus. [MJNMCH] [GIMSH] [SRIMS] [IQ City] [2020]

6.Explain the reason for development of 'Moon-face', 'Buffalo-hump' and 'hyperpigmentation' in Cushing's syndrome. [GIMSH][2020]

7.Acromegaly may be associated with optical field defects. [DHGMC][2020]

8.Hyperpigmentation occurs in Addison's disease. [DHGMC] [Malda] [2020]

9.Glucocorticoids are drugs of choice in severe inflammation. [BSMC] [2020]

10. Edema is absent in primary hyperaldosteronism. [MSDMCH] [BSMC] [2020]

[2019]

11. Steroid therapy should not be stopped abruptly? [IQ City] [2020]

12. Beta blocker is used to treat hypertension. [Malda] [2020]

13. Furosemide is used as diuretics. [JIMSH] [2019]

14. Intake of carbohydrates in diet stimulates secretion from pancreas. [MJNMCH] [2019]

15. Increased incidence of Diabetes mellitus occurs in Acromegaly patients. [MMCH] [2019]

16. Sympathetic nervous system is considered as the pathway for "fight or flight" response. [BSMC] [2019]

17. Tetany occurs in patients of hypocalcaemia. [RGMC] [2019]

REPRODUCTIVE SYSTEM

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

1.Define menstrual cycle. Mention the changes in endometrium, cervical and vaginal epithelium and changes in hormonal level in plasma and plasma levels during menstrual cycle. Explain the physiological basis of actions of contraceptive pills and clinical importance of safe and unsafe period.(1+6+6+2)[MJNMCH] [GIMSH] [2020][2019]

2.Describe the phases of ovarian cycle with a suitable diagram. What is LH surge? What is the role of corpus luteum in pregnancy? [7+3+5][GIMSH][2020]

3.List the stages of spermatogenesis. Outline the factors influencing spermatogenesis.[KPC] [RPHGMCH] [2020]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

1.What is menstrual cycle? Why pregnancy causes stoppage of menstruation? Comment on the effect of exclusive breast feeding on menstruation. [2+4+4] [RGKAR] [2020]

2.Define spermatogenesis. Enumerate the different steps of spermatogenesis. What are the physiological effects on the body when RAAS mechanism is activated ?[2+3+5] [Purulia] [2020]

3.Mention the steps of oogenesis. Write briefly the hormonal basis of ovarian cycle. What is gonadal dysgenesis.[3+4+1] [DHGMCH][2020]

4.What is ovulation? Write the effects of hormones on Ovulation. What are the tests of ovulation? (1+5+4)[MMCH] [IQ City] [2020]

5.Discuss spermatogenesis and the factors that regulate it. What are the functions of Sertoli cells?(7+3)[RPHGMCH] [BMC] [2020][2019]

6.Discuss the ovarian cycle and its hormonal basis. Explain why excessive breast feeding causestemporary infertility. (5+5) [COMJNM] [2019]

7.Describe the ovarian and uterine hormonal changes in menstrual cycle with diagram. What arethe signs of ovulation? (7+3) [RGKAR]

8.What are the phases of menstrual cycle? Describe the hormonal control of ovulation. Add a note on "Tests for ovulation". (2+6+2) [COMJNM] [2019]

9.What is ovulation? What are the hormonal changes associated with ovulation? How can youdetect ovulation? (1+5+4) [MCK] [2019]

10. Describe the stages of spermatogenesis with the name of the hormones at each stage. How is theprocess helped by Sertoli cells? Discuss briefly the process of fertilization. What is the difference between azoospermia and asthenospermia? (4+2+3+1) [BSMCH] [2019]

11. Write the stages of spermatogenesis. What do you mean by 'Cryptorchidism'? (7+3) [SRIMS] [2019]

12. Define menstrual cycle. What are the changes taking place in the uterus during menstrual cycle?(7+3) [SRIMS] [2019]

13. Enumerate the different placental hormones and describe in brief their physiological roles. Describe the physiological basis behind the biological and immunological pregnancy tests. (7+3) [RGMC] [2019]

SHORT NOTES (5 MARKS EACH)

1.Physiological basis of any one of the pregnancy test. [DHGMC][2020]

2.Blood-testis-barrier. [BMC] [Malda] [2020]

3.Lactational amenorrhea

4.Sertoli cell [RG KAR] [MSDMCH]

5.Spermatogenesis [MJNMCH] [2019]

6.Changes in copulatory habits in infertile couples. [MJNMCH] [2019]

7.Oral contraceptive pills [COMJNM] [2019]

8.Contraceptive pills [RPHGMCH] [2019]

EXPLAIN WHY (4 MARKS EACH)

1.Abortion occurs if ovariectomy is done before 14 weeks of pregnancy. [NBMC][2020]

2.Explain the reason of development of osteoporosis in menopausal female. [GIMSH] [2020]

3.Sertoli cells have an important role in spermatogenesis. [BSMC] [2020]

4.Oophorectomy before 12 weks may lead to abortion. [BSMC] [2020]

5.Cryptorchidism leads to infertility. [IQ City] [2020]

6.Pregnancy usually does not occur during lactation. [SRIMS] [IQ City] [2020] [2019]

7.LH surge is essential for ovulation. [Malda] [2020]

8.Safe period is not always safe. [MJNMCH] [2019]

9.Fetal well beingness can be determined by estimation of Estradiol in mother's urine. [MMCH] [2019]

10. Low birth weight females often show amenorrhea. [COMJNM] [2019]

11. Regular administration of Estrogen & Progesterone combination pill produces contraception.[IPGMR] [2019]

12. Oligozoospermia and azoospermia is seen in patients of Cryptorchidism. [RGMCH] [2019]

CENTRAL NERVOUS SYSTEM

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

1.Enumerate the anatomical and functional subdivision of cerebellum. What are the afferent and efferent connections of cerebellum? With a suitable diagram describe the internal organization of cerebellum with different fibers, stimulatory and inhibitory cells and nucleus within different layers of cerebellum. What are the functions of cerebellum? Name the different features of cerebellar lesions. [2+3+4+3+3] [NBMC] [BMC] [2020]

2.What is pain? With a suitable diagram describe the pathway of pain from periphery to cerebral cortex. Definereferred pain. Discuss the theories of referred pain. State a note on endogenous pain inhibiting mechanism. (1+2+4+1+4+3) [COMJNM] [Purulia] [2020][2019]

3.Enumerate the ascending neural tracts. State the course of lateral spinothalamic tract with appropriate diagram. Explain the course and mechanism of action of endogenous analgesia. Mention the physiological basis of action of analgesic drugs. [2+6+5+2] MJNMCH] [2020]

4.With the help of a diagram describe the origin, pathway, termination of cortico-spinal tract.Mention features of Upper Motor Neuron Lesion. (3+8+4) [JIMSH] [2019]

5.Name the receptors that mediate pain. Explain the difference between fast and slow pain. Withthe help of a labeled diagram trace the pathway of pain. Define referred pain and mention two theories regarding referred pain? (2+3+7+3) [RGKAR] [2019]

6.Draw the circuitry of Cerebellum. Write the functions of cerebellum. Write the clinical features ofCerebellar lesion. (6+4+5) [MMCH] [2019]

7.What are the functional divisions of cerebellum? Describe the connections and functions of cerebellum. Add a note on "signs of cerebellar dysfunction". (2+5+5+3) [ESIC Joka] [2019]

8.State Bell Magendie's law. Name the different pathways that carry touch sensation and describethem in brief. Name some higher sensory functions. What do you mean by endogenous pain inhibiting system? (2+3+6+2+2) [MCK] [2019]

9.Define pain. With proper diagram describe the pathway of fast pain. Explain how pain is inhibitedby the body. With example explain what referred pain is. (1+6+6+2) [BSMCH] [2019]

10. What are the functional parts of Cerebellum? Mention the physiological roles of each part.Describe the signs and symptoms of cerebellar lesion with necessary explanation. (2+5+5)[DHGMCH] [2019]

11. Enumerate the different parts of Basal ganglia. Explain the internal circuit of basal ganglia with aflowchart diagram. State the functions of basal ganglia. Mention the pathophysiological basis of Parkinsonism. (2+5+5+3) [MSDMCH] [2019]

12. What are ascending tracts? Trace the pain pathway from receptor to cortex with suitable diagram. What is referred pain? Explain why injured soldiers do not feel pain as long as they are inthe battlefield? (2+7+2+4) [IPGMER] [2019]

13. Enumerate the connections of Hypothalamus. Explain the functions of hypothalamus. (5+10) [SRIMS] [2019]

14. Name the ascending tracts of spinal cord and the manifestations they carry. What is dissociatedsensory loss? (10+5) [KPC] [2019]

15. Describe the direct and indirect pathways of the Basal Ganglia. Enumerate the functions of thecerebellum. Add a note on Cerebellar Lesion. (7+5+3) [KPC] [2019]

16. Define stretch reflex. Give the structures, innervations and functions of muscle spindle. Mentionhigher control of stretch reflex. (2+8+5) [RPHGMCH] [2019]

17. Enumerate the different descending motor tracts that form the medial and lateral motor systems. Describe the origin, course, termination and function of the corticospinal tracts with properlabeled diagram. Explain the physiological basis of the clinical features seen in Brown-Sequard syndrome. (3+8+4) [RGMC] [2019]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

1.Explain the internal circuitry of basal ganglia and cerebellum. Explain their roles in control of planned motor activities. What is Parkinson's disease? [3+3+3+1] [MJNMCH] [2020]

2.Explain the different functions of hypothalamus. [MJNMCH] [2020]

3.What is sensory receptor? Describe the pathway of fine touch. Add a note on Brown Sequard Syndrome. [2+5+3] [BMC] [2020]

4.Demonstrate types of neurons present in cerebellum. Briefly discuss the fundamental circuit ofthe cerebellar cortex. Give an account of the functional division of the cerebellum. (2+5+3) [COMJNM] [2019]

5.Expand your idea about corticospinal tract with a neat diagram. What do you mean by lower motor neuron (LMN) and upper motor neuron (UMN)? Briefly discuss the outcome of lesions in LMNand UMN. (5+2+3) [COMJNM] [2019]

6.Define pain. What are the pain inhibiting mechanisms? Draw the pathway of

endogenous paininhibiting mechanisms. (2+2+6) [MMCH] [2019]

7.Mention the fine touch pathway from periphery to brain with proper diagram. What are the paininhibiting mechanisms? (4+3) [DHGMC] [2019]

8.Write the functions Basal Ganglia. What is 'Parkinson's disease'? (7+3) [SRIMS] [2019]

SHORT NOTES (5 MARKS EACH)

1.Withdrawal reflex. [NBMC] [2020]

2.Phantom limb. [NBMC] [2020]

3.Hypothalamo-Pituitary-Ovarian axis. [NBMC] [2020]

4.Referred pain. [BMC] [2020]

5.Alzheimer disease and senile dementia. [BMC] [2020]

6.NREM sleep and REM sleep. [BMC] [2020]

7.Stretch reflex [MCK] [2019]

8.Endogenous pain inhibiting pathway [MSDMCH] [2019]

9.Paradoxical sleep [RPHGMCH]

EXPLAIN WHY (4 MARKS EACH)

1.Touching and shaking of an injured part can reduce pain sensation / Gentle message after giving intramuscular injection reduce pain sensation. [JIMSH] [NBMC][2020][2019]

2.Carbidopa is added with levodopa for treatment in parkinsonism. [BMC] [2020]

3.Purely pyramidal tract lesion is associated with hypotonia. [BMC] [2020]

4.Mid-collicular lesion in brain may produce extensor rigidity.[MCK] [BMC] [2020]

5.In Brown-Sequard syndrome below the level of the lesion-loss of pain sensation in opposite sideand motor loss of same side are seen. [MMCH] [2019]

6.Babinski's sign is positive in infants. [COMJNM] [2019]

7.Dissociated anaesthesia is seen in syringomyelia. [COMJNM][2019]

8.Romberg's test is positive in sensory ataxia. [MCK] [2019]

9.Intention tremor is found in cerebellar lesion. [RGMCH] [SRIMS] [BSMC] [2019]

10. L-Dopa is an effective cure of Parkinsonism. [DHGMC] [2019]

11. Muscle tone is high in UMN lesion. [DHGMC] [2019]

12. In unilateral cerebellar lesion same side of the body is involved as the lesion. [BMC] [2019]

13. A patient with appendicitis may present with pain around umbilicus. [BMC] [2019]

14. Rigidity occurs in Parkinson's disease. [RPHGMCH] [2019]

SPECIAL SENSES

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

1. Describe the mechanism of hearing in detail. Write comments on 'Conductive deafness' and'Nerve deafness'. (10+5) [SRIMS] [2019]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

1.Write a short note on 'Organ of Corti'. Explain why optic tract lesion leads to homonymous hemianopia? (5+5) [COMJNM] [2019]

2.With the help of labeled diagram describe the visual pathway and the effect of lesion at thevarious levels of the pathway. (5+5) [RGKAR] [2019]

3.What are photoreceptors? Explain the functions of photoreceptors. Describe the mechanism ofphototransduction. (1+3+6) [COMJNM] [2019]

4.Describe the mechanism of phototransduction. What is Argyll-Robertson Pupil? (7+3) [MCK] [2019]

5.Describe how sound waves are converted to electrical impulses in the ear. What is deafness? Classify deafness and mention their causes. Name the tests for diagnosing deafness and explain howthey differentiate the types of deafness. (4+1+2+3) [BSMC] [2019]

6.How does the vestibular apparatus maintain equilibrium? Mention the concept of color vision inbrief. What is protanopia? (4+2+1) [DHGMCH] [2019]

7.What are the receptors for vision? Discuss phototransduction mechanism. (2+8) [RPHGMCH] [2019]

8.Enumerate the different parts of the human ear that are involved in hearing. Explain the importance and mechanism of impedance matching in hearing. Describe the mechanism of perception of pitch and loudness of sound by the human ear. (3+3+4) [RGMC] [2019]

SHORT NOTES (5 MARKS EACH)

1.Organ of Corti [MMCH] [2019]

2.Weber test. [DHGMC] [2019]

3.Dark blindness [MSDMCH] [2019]

4.Refractive errors of eyes. [SRIMS] [2019]

EXPLAIN WHY (4 MARKS EACH)

1.Pupillary light reflex is absent but accommodation reflex is present in Argyll Roberson Pupil. [BMC] [2020]

2.In occipital lobe lesion there is usually loss of peripheral vision with intact macular vision. [BMC] [2020]

3.Visual acuity is maximum at fovea centralis. [RGMC] [SRIMS] [COMJNM] [2019]

4.On entering a dimly lit room, (immediately, after being in a bright light environment), some time isneeded before we can see properly. [MCK] [2019]

5.Lesions of optic tract cause homonymous hemianopia of opposite side. [BSMCH] [2019]

6.Rinne's test is negative in conductive deafness. [DHGMC] [2019]

7.Night blindness occurs due to Vit. A deficiency. [DHGMC] [2019]

8.Bitemporal hemianopia is seen in pituitary tumor. [MSDMCH] [2019]

9.Lesion at optic chiasma causes bitemporal hemianopia whereas lesion at optic radiation causeshomonymous hemianopia. [IPGMER] [2019]

10. Acromegaly may be associated with visual field defect. [KPC] [2019]

11. Near point of vision recedes as age advances. [KPC] [2019]

12. In occipital lesion there is loss of peripheral vision with intact macular vision. [BMC] [2019]

BIOCHEMISTRY

NUCLEOTIDE METABOLISM, CHEMISTRY OF NUCLEOTIDES AND NUCLEICACIDS MOLECULAR BIOLOGY & GENETICS

LONG ANSWER TYPE QUESTIONS (15 MARKS)

2020:

1. Explain schematically the steps of transcription of prokaryotic mRNA. What are the basic differences between prokaryotic and eukaryotic transcription? Why is it essential to modify mRNA post transcriptionally? (8+3+4) [Purulia]

2. Compare between the initiation phase of translation of prokaryotes and eukaryotes. Discuss the mechanism of action of diphtheria toxin on eukaryotic translation. Describe the chemical nature of peptidyl transferase activity. (10+3+2) [MJNMCH]

3. Describe the stages of initiation and elongation of translation process in E.coli with a suitable diagram. State the mechanism of action of following antibiotics in the inhibition of translation process:

i) Streptomycin

ii) Chloramphenicol

iii) Puromycin. (9+6) [MCK]

4. Define operon. What do you mean by inducible gene and housekeeping genes? Describe the lac operon model for regulation of gene expression in E.coli with suitable diagram. (2+3+10) [BSMS]

5. A 46 yr old male patient presents to emergency dept. he had alcohol at night and the following morning he woke up with severe pain in his right big toe. There was no trauma to the toe or any other joint. His right big toe was swollen, warm, red and tender. Lab investigations showed increased levels of uric acid in blood.

a. What is the likely diagnosis?

b. Is estimation of uric acid in blood a correct step in this condition? Justify.

c. How can consuming alcohol be related to the disease.

d. What are the other causes of increased levels of uric acid in blood? [1+3+5+3] [NRS]

2019:

6. Describe the process of initiation and elongation of replication in E. coli with the help of a diagram of replication fork. Mention the difference in replication with the eukaryotes. Write a note on xeroderma pigmentosa. (10+3+2)[RGMC] [RGKAR]

7. Describe the RNA polymerase in prokaryotes and eukaryotes. Give an account of promoter sites of eukaryotesand prokaryotes. Enumerate the inhibitors of transcription in prokaryotes. Components of RNA polymerase. (6+6+3)[BSMC] [KPC]

8. Enumerate the enzymes of prokaryotic replication system, discussing the function of each. Categorize thevarious DNA mutations and repair mechanism. (5+6+4)[ESICMCH]

9. Explain the principles of recombinant DNA technology. Enumerate the components required for this technology. Discuss restriction endonuclease with two examples. Enlist the biomedical applications of recombinant DNA technology. (2+2+3+4)[ESICMCH]

10. Describe in detail about DNA dependent RNA polymerase in prokaryotes and its role in prokaryotic transcription along with prokaryotic promoters. Describe in short, the post-transcriptional modification ineukaryotic mRNA. (4+3+2+6)[MSDMCH]

11. Describe the phases of activation, initiation, elongation and termination of prokaryotic biosynthesis of protein.Give a note on its inhibitors. (3+3+3+3+3) [MJNMCH]

12. Describe catabolism of purine nucleotides. How uric acid is excreted from body? What is the difference between hyperuricemia and gout? What is Okazaki fragment? White down post-transcriptional modification ineukaryotes. (5+2+2+2+4)[MMCH]

13. Translation in eukaryotes with suitable diagram. Explain how chloramphenicol, puromycin, diphtheria toxin actto inhibit protein synthesis. What are the key properties of genetic code? What is Wobble hypothesis? (7+3+3+2)[SRIMS]

14. Mention the character and functions of histone protein. Illustrate the structure and functions of mRNA. Enumerate characteristics of genetic code. Elucidate the regulation of gene expression in eukaryotes. Mentiontwo inhibitors of prokaryotic translation with their mechanism of action. (2+3+3+4+3) [RPHGMCH]

15. With the help of diagrams, describe the process of replication. Explain anyone mechanism of DNA repair.Name 2 inhibitors of replication. (9+4+2)[BMC]

16. Describe in detail about DNA dependent RNA polymerase in Prokaryotes and its role in prokaryotic transcription along with the prokaryotic promoters. Describe in short, the post transcriptional modification ineukaryotic mRNA. (4+3+2+6)[MSDMCH]

17. With the help of an experiment prove that 'DNA replication is semi-conservative'. Delineate the steps of initiation of Replication. Differentiate between the process of Prokaryotic and Eukaryotic DNA replication. Namesome clinically important replication inhibitors indicating their site of action. (4+4+4+3)[IPGMER]

18. Mention levels of regulation of gene expression in prokaryotes. Name the process by which gene expressionis regulated at transcription level in prokaryotes. Describe any one of them. (5+5+5)[MMCH]

19. Describe the phases of activation, initiation, elongation and termination of prokaryotic biosynthesis of protein. Give a note on its inhibitors. (3+3+3+3+3)[MJNMCH]

20. Mention the character and functions of histone protein. Illustrate the structure and functions of mRNA. Enumerate characteristics of genetic code. Elucidate the regulation of gene expression in eukaryotes. Mentiontwo inhibitors of prokaryotic translation with their mechanism of action. (2+3+3+4+3)[RPHGMCH]

SHORT ANSWER TYPE QUESTIONS (10 MARKS)

2020:

1. Define genetic code. State the characteristics of genetic code. Explain the degeneracy of genetic code with the help of wobble hypothesis. With the help of diagram explain the splicing of primary m RNA in eukaryotes.(1+2+3+4) [Sagore Dutta]

2. Write down with the help of diagram the initiation phase of translation in E.coli. Calculate the number of high energy compounds required for the synthesis of protein. Name at least 4 post translational modifications of proteins. (5+3+2) [Sagore Dutta]

3. Enumerate the salient features and requirements of replication. Describe the process of replication of eukaryotes in short. Mention the inhibitors of replication in both prokaryotes and eukaryotes. (1+1+6+2)
[SRIMS]

4. Define mutation. Describe different types of mutation with examples. (2+8) [MCK]

5. Define PCR. What are the types of PCR? White down the steps of PCR. Enumerate 4 applications of PCR. (1+2+5+2) [BSMC]

2019:

6. What is transcription? With the help of diagram briefly describe the process of transcription in mammals.Mention applications of reverse transcriptase. (1+6+3)[COMJNM]

7. Describe the steps of initiation and elongation of prokaryotic translation with suitable diagram. Comment onthe role of p53 in relation to carcinogenesis. (7+3)[MCK]

8. Discuss briefly about Restriction Enzyme on the light of: (i) Classification (ii) nomenclature (iii) sequence recognized cleavage sites (iv) bacterial source with two different examples. Explain the use of RE to make newrecombinant DNA molecules by a schematic diagrammatic representation. (3+7)[MSDMCH]

9. Explain the operon concept of gene regulation with the lac operon model. Write a note on hormone responseelement. (7+3)[RGMC] [NRS]

10. Mention the different types of DNA damage. Enumerate the mechanism of DNA repair. Write down in brief thesteps of nucleotide excision repair with the help of diagrams. (3+3+4)[BSMC]

11. What enzymes generate a charged tRNA? How is the start AUG distinguished from other AUGs in eukaryotic translation? Contrast with prokaryotes. What NTP gets hydrolyzed in all three steps of translation? Enumerate thevarious post-translational modifications and discuss covalent modification in detail. (1+3+1+2+3) [ESICMCH]

12. Discuss the process of eukaryotic transcription. Enumerate the post-transcriptional modification of mRNA.(6+4) [NRS] [KPC]

13. What is rDNA technology? Explain with diagrams the different tools of rDNA technology. Write in brief how thefinal product of the same is identified or screened. (1+6+3)[SRIMS]

14. What are Purine synthesis disorders? Classify them with clinical features. (3+7)[KPC]

15. Describe the principle, procedure and application of PCR. (2+4+4)[RGKAR]

16. Which enzyme is known as molecular scissor? Write about it mechanism of action and application in rDNA technology? (1+2+2)[MJNMCH]

17. Discuss the lac operon model of regulation prokaryotic gene expression. How does it differ from Eukaryoticone? (7+3)[NRS]

18. Describe briefly about Restriction Enzyme (RE) on the light of:

a. Classification

b. Nomenclature

c. Sequenced recognized cleavage sites

d. Bacterial source (With two different examples)

Explain the use of RE to make new Recombinant DNA molecules of Schematic diagrammatic representation. (3+7)[MSDMCH]

19. With the help of a diagram, write down the steps of initiation of process of translation in E. coli. Give an example of inhibitor of prokaryotic translation process at the steps of initiation & translocation phase. Calculatemoles of ATP utilized in synthesis of one peptide bond in translation process. (7+2+1)[IPGMER]

20. Describe the technique and application of southern blotting. (5+5)[MJNMCH]

21. What is mutation? What are mutagens? Describe point mutation & frame shift mutation with examples. (2+2+2+2+2)[MJNMCH]

22. Give a brief account of proteins involved in DNA replication. Enumerate the types of DNA damage. How does a cell sense DNA damage and control it? (3+3+4)[DHGMC]

23. Describe the process of prokaryotic transcription. Enumerate different types of post-transcriptional modification of hnRNA. (4+3)[DHGMC]

24. In lac-operon module of gene expression, give an account of mechanism of repression and de-repression. What are the various levels of gene-expression control? (5+2=7)[DHGMC]

SHORT NOTES (5 MARKS EACH)

2020:

1. DNA polymerase in E.coli [Sagore Dutta]
2. RNA editing [Sagore Dutta]
3. Initiation phase of translation in E.coli [Sagore Dutta]
4. Nucleosome [Sagore Dutta]
5. micro RNA [DHGMC]
6. Mismatch repair [DHGMC]
7. Synthetic nucleotides [DHGMC]
8. Types of DNA [Malda]
9. ELIZA vs. RIA [Malda]
10. Post transcriptional modifications [NRS]
11. PCR [NRS]
12. Drugs inhibiting translation [NRS]

2019:

13. ELISA. [MMCH]
14. Which enzyme is known as molecular scissors? Write about its mechanism of action and applications in r-DNAtechnology. (2.5+2.5)[MJNMCH]
15. Cosmid [DHGMC]

EXPLAIN WHY (4 MARKS)

2020:

1. All the three DNA polymerases are essential to maintain the fidelity of DNA Replication.[Purulia]
2. Histones interact with each other in a very specific way to form the histone octamer. [Purulia]
3. The chemical nature of DNA offers it more stability as compared to RNA. [Purulia]
4. Synthetic nucleotide analogues are used chemotherapeutically. [Purulia]
5. Euchromatin and heterochromatin differs in transcriptional activity. [Purulia]
6. Tm is influenced by the base composition of DNA. [Purulia]
7. The chromosome appears as beads on strings under electron microscope. [Purulia]
8. Unusual bases in DNA and RNA serve important functions to oligonucleotide recognition. [Purulia]
9. DNA is evolutionally superior to RNA as genetic material. [Purulia]
10. Telomerase is an attractive target for cancer chemotherapy. [Purulia]
11. B DNA is the most stable form under physiological conditions. [Purulia]
12. tRNA contains unusual bases. [Purulia]
13. Each arm of tRNA serves a unique function. [Purulia]
14. HAT plays a pivotal role in the regulation of gene expression. [Purulia]
15. Nucleoplasmin is essential for the assembly of nucleosome. [Purulia]
16. snRNA and microRNA have important roles in gene expression. [Purulia]
17. Non histone proteins present in the chromatin participate in DNA metabolism. [Purulia]
18. Covalent modifications of histone play important role in chromatin structure and function. [Purulia]
19. Presence of thymine in DNA instead of Uracil facilitates selective repair of DNA damage. [MCK]
20. Genetic code is degenerate. [NRS]
21. Allopurinol is the drug of choice of gout treatment.[COMJNM]

22. Excess alcohol intake aggravates gout symptoms. [SRIMS]

2019:

23. PCR can produce huge amount of DNA from a single DNA segment. [BMC]
24. Post-transcriptional modifications occur in hnRNA. [BMC]
25. SDS-PAGE is a useful tool to determine molecular weight of a novel protein. [NRS]
26. Xeroderma pigmentosum is a defect Corona virus infection.[MSDMCH]
27. IPTG is a gratuitous inducer of lac operon. [MSDMCH]
28. RFLP is a useful tool for diagnosing genetic diseases. [IPGMER]
29. Fluoroquinolones are used in the treatment of UTI. [MJNMCH]
30. DNA denaturation is essential for hybridization. [DHGMC]
31. Xeroderma pigmentosa occurs due to defect in DNA repair.[DHGMC]
32. RNA can act as an enzyme.[DHGMC]

CARBOHYDRATE CHEMISTRY-DIGESTION & ABSORPTION, GENERAL METABOLISM, CARBOHYDRATE METABOLISM

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

2020:

1. a) On anaerobic glycolysis pyruvate is converted to lactic acid and NADH is converted to NAD. How this NAD is utilised to continue anaerobic glycolysis?

b) What are the irreversible steps of Glycolysis?

c) How glycogen synthase enzyme act to deposit glycogen in liver?

d) Name 4 key enzymes of neoglucogenesis

e) How oxaloacetate is transfers from mitochondria to cytosol?

f) Name the factors which regulate blood glucose homeostasis

g) How TCA cycle is regulated? Mention the action of insulin on enzymes of carbohydrate metabolism. (2+3+5+2+3+2+3)[MMCH]

2. Discuss how Galactose is metabolized in the body and the disorders associated with its metabolism. Add a note on glycogen storage disorders. Why does G6PD deficiency lead to hemolytic anemia.(6+6+3) [GIMSH]

3. Regulatory steps of TCA cycle and the mode of regulation. Calculate the energy of TCA cycle and enumerate the vitamins involved in it.(2+8+5) [JIMSH]

4. Explain with the flow diagram how glycolysis and gluconeogenesis in the liver are controlled by fructose-2, 6-BP and the bifunctional enzyme 6-phosphofructo-2-kinase. [JIMSH]

5. Describe the steps of Glycogenesis and glycogenolysis. Add a note on its regulation. Enumerate the Glycogen storage disorders. [6+4+5] [ICARE] [2020]

6. Describe the steps of HMP Shunt pathway; write the significance of the pathway. What is essential pentosuria? Write the significance of Glucose-6-phosphate Dehydrogenase. [6+3+3+3] [ICARE] [2020]

2019:

7. Glycogen synthesis and degradation in reciprocally regulated-explain with flow chart. [MCK]

8. Mention differences Glycoproteins and Proteoglycans. What are the substrates of neoglucogenesis? Draw aflow diagram of neoglucogenesis from glycerol along with the enzymes involved. Why hexokinase method is considered superior to glucose oxidase-peroxidase method for glucose estimation? (4+2+6+3)[COMJNM]

9. What is the significance of HMP shunt? Why carbohydrates can be converted into Lipids but the reverse is untrue? How is Glycogen Metabolism regulated by the covalent modifications? (4+3+8)[RGKAR]

10.Explain Mutarotation with its clinical application. Compare and contrast starch and glycogen. Explain sodium dependent glucose transporter (SGLT) with its utility. Name three water soluble vitamins with their active form inpyruvate dehydrogenase (PDH) complex. Illustrate anaplerotic reactions and amphibolic role of TCA cycle. (2.5+2.5+2.5+2.5+5)[RPHGMCH]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

2020:

1. How does cAMP regulates glycogen metabolism in liver? Explain the link- both uncontrolled DM and prolonged fasting produce ketosis but its magnitude is less in case of prolonged fasting.(5+5)

2. Gluconeogenesis is not a simple reversal of glycolysis. Justify your answer by giving the reactions. Add a note on energetics of the pathway and role of malate here. (6+2+2) [GIMSH]

3. Regulatory enzymes of glycolysis and mode of regulation. [JIMSH]

2019:

4. On emergency a 25-year-old woman with type 1 diabetes presented with a 5-day history of weakness, fever, productive cough, and repeated episodes of non-bloody & non bilious vomiting. She also reported a 2-week history of polyuria and polydipsia and a 5 kg weight loss and fatigue. On examination, her temperature was 99.1°F, blood pressure was 98.64 mmHg, pulse was 136/min, and rate of respiration was 36 breaths/min. There was a strong sweet fruity odor in the exam room. The patient was drowsy but cogent. Her lung sounds were clearwithout wheezes or rhonchi. Her heart sounds were normal. Laboratory results were remarkable for a room air arterial blood gas with pH of 7.12, pCO_2 of 17 mm/Hg, and bicarbonate of 5.6 mEq/L. Urinalysis revealed 4+ glucose and 3+ ketones. Chemistry panel revealed glucose of 420 mg/dl, BUN of 16 mg/dl, creatinine of 1.3 mg/dl, sodium of 139 mEq/L, chloride of 112 mEq/L, CO_2 of 11.2 mmol/L and potassium of 5.0 mEq/L. Chest X-Ray revealed no infiltrate (2+4+4) [IPGMER]

a) What is your provisional diagnosis?

b) State the biochemical background of sweet fruity odor in the examination room.

c) Explain how the findings of high blood glucose is related to the given arterial blood gas analysis.

5. Classify monosaccharides and give one example from each class. Mention three examples of carbohydrates asmedicine. Mention the difference between starch and glycogen. (4+3+3)[MMCH]

6. What is meant by the term Inborn Errors of Metabolism? Give one example each from Carbohydrate, Lipid,Protein, Nucleotide metabolism. Why ketones can be synthesized by the liver but cannot be degraded there?(5+5)[RGKAR]

7. Define BMR. What are the factors affecting BMR? Mention the significance of BMR. Write a note on ProteinSparing effect of Carbohydrates. (2+2+2+4)[MJNMCH]

SHORT NOTES (5 MARKS EACH)

2020:

1. PDH complex. [COMJNM]
2. Key gluconeogenetic enzymes [JIMSH]

2019:

3. Glycemic index of Carbohydrates.[IPGMER]

EXPLAIN WHY (4 marks each)

2020:

1. Lipogenesis is higher when sucrose is fed more than glucose. [Purulia]
2. UDP sugar derivatives are essential for glycogen and galactose metabolism.[Purulia]
3. G6PDH is the responsible enzyme for maintaining the erythrocyte membrane integrity. [COMJNM]
4. G6PD deficiency aggravates hemolytic anemia [MJNMCH]
5. Krebs cycle is an amphibolic pathway. [GIMSH]
6. NaF is used in vial for estimation of plasma glucose in lab. [SRIMS]
7. Galactosemic patients are often associated with congenital cataracts. [JIMSH]
8. Estimation of G6PD is important to treat a patient suffering from malaria with primaquine. [NRS]

2019:

9. Dietary fibers are also considered as essential part of diet.[MCK]
10. Benedict Test in urine is found positive in Alkaptonuria.[IPGMER]
11. Skeletal muscle is deficient of glucose-6-phosphatase.[MMCH]

12. Fructose is more rapidly metabolized through glycolysis than glucose.[RGKAR]

13. Explain why PFK1 is known as pacemaker of glycolysis? Galactosemic patients are often associated with congenital cataract, justify. (2.5+2.5)[RPHGMCH]

14. Fructose is more rapidly metabolized through glycolysis than glucose.[RGKAR]

15. Explain why PFK1 is known as pacemaker of glycolysis? Galactosemic patients are often associated with congenital cataract, justify. (2.5+2.5)[RPHGMCH]

16. Explain why deficient G6PD status leads to primaquine induced hemolysis in patients. HDL participates in reverse cholesterol transport, justify. (2.5+2.5)[RPHGMCH]

17. Rapaport Leubering Cycle is absolutely needed in the erythrocytes.[RGKAR]

18. Lactic acidosis occurs in Von-Gierke-Disease. [BSMC]

19. In human body glucose can be converted to fat while the reverse is not possible.[MJNMCH]

LIPID CHEMISTRY-DIGESTION AND ABSORPTION, LIPID METABOLISM

LONG ANSWER TYPE QUESTIONS (15 marks each)

2020:

1. Give a schematic representation of the steps of beta oxidation of stearic acid. What are the rate limiting steps of this metabolic pathway? Which are the vitamins that are essential for beta oxidation and what are the reactions in which they function? (7+3+5) [Purulia]

2. a) Compare between fatty acid synthesis and fatty acid oxidation.

   b) How fatty acids are activated before being catabolized?

   c) What is the role of carnitine in fatty acid oxidation?

   d) What enzymes are involved in ethanol oxidation?

   e) What amount of energy is obtained on oxidation of 1gm of alcohol?

   f) Development of hypoglycemia may occur in abnormality of fatty acid oxidation -

explain. (4+4+3+3+2+4) [MMCH]

3. A 50 year old company executive on a routine checkup came up with the following lab reports:

Hb: 14.3g/dl

Blood urea: 30mg/dl

Serum creatinine: 1.3mg/dl

Serum cholesterol: 360mg/dl

Serum triglyceride: 249mg/dl

Serum LDL: 238mg/dl

Serum HDL: 35mg/dl

a) Mention the normal serum level of cholesterol, triglyceride, LDL and HDL

b) How does HDL help in reverse cholesterol transport?

c) Write down the rate limiting step of cholesterol biosynthesis and name the rate limiting enzyme

d) Name the inhibitor of the enzyme

e) State the end products of cholesterol catabolism and pathway of its formation. (2+5+2+1+5) [MJNMCH]

4. Describe the chylomicrons, VLDL, LDL and HDL metabolism. Add a note on fatty liver and lipotropic factors. [8+4+3] [ICARE]

2019:

5. Enumerate the lipoproteins. Describe the process of reverse cholesterol transport. Give a brief account on dyslipoproteinemias. (3+6+6)[BSMC]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

2020:

1. Describe schematically the role of LDL in endogenous cholesterol transport. Describe the mechanism of cellular uptake of cholesterol from circulating LDL. (5+5) [Purulia]

2. How heme is catabolized in colon. Describe briefly the steps of beta oxidation of

even chain fatty acids.(5+5)
[COMJNM]

3. Describe the steps of Ketogenesis and kketolysis. What is Ketosis, why ketosis seen in uncontrolled Diabetes Mellitus and prolonged starvation. [6+4] [ICARE] [2020]

2019:

4. Classify Sphingolipids. Enumerate the functions of sphingolipids. Mention three diseases due to inability to breakdown sphingolipids. (3+4+3) [MMCH]

5. Write the key regulatory reaction of cholesterol synthesis with its clinical significance. Name two specializedcompounds derived from cholesterol. Classify lipoprotein with its salient features, functions and major apoproteins. (2+2+4=8)[RPHGMCH]

6. What is normal cholesterol level in plasma? What is its clinical significance? How cholesterol is transportedfrom liver to peripheral tissues and back? (1+3+6)[COMJNM]

7. Explain the metabolism of VLDL and LDL with the help of a diagram. [RGKAR]

8. a) Mention the role of glutamate in ammonia formation. Why is Ammonia toxic in CNS? (3+2)

b) Give a brief note on the regulation of cholesterol synthesis. Mention the factors that influence blood cholesterol level. (3+2)[IPGMER]

9. State the reference interval of serum cholesterol. What is the precursor molecule for cholesterol biosynthesis?Name the rate limiting step in cholesterol biosynthesis. Write down the steps for synthesis of mevalonate from acetyl CoA. (2+1+2+5)[Sagore Dutta]

SHORT NOTES (5 MARKS EACH)

2020:

1. A young teenage girl from a well to do family has come to the OPD in a depressed state of mind. After talking to her mother you realise she is suffering from anxiety and depression due to obesity. As a physician how would you counsel her? What advice will you give her and her mother to regulate her weight? [Purulia]

2. An elderly lady was brought unconscious to the emergency room. She was found to be fasting for the last 4 days for religious rituals. On examination the patient had fruity odour in her breath and sweaty cold skin. What could be the probable diagnosis? Which analytes would have abnormal levels in her blood? [Purulia]

3. Familial hyperlipoproteinemia [MJNMCH]

4. Describe the carnitine transport system for mitochondrial transport of FA. [JIMSH]

5. Eicosanoids – classification and clinical importance of any one. [MCK]

6. Metabolic fate of VLDL. [RPHGMCH]

EXPLAIN WHY (4 MARKS EACH)

2020:

1. Imbalance in the formation of triacylglycerols and its export from the liver can cause fatty liver. [Purulia]

2. When fat digestion is impaired, other food materials are also poorly digested. [Purulia]

3. Substitution of dietary saturated fatty acids with PUFA has a cholesterol lowering effect. [Purulia]

4. Elongation of fatty acid chain occurs in the endoplasmic reticulum. [Purulia]

5. Phospholipase A2 aids in emulsification and digestion of lipids. [Purulia]

6. LCAT and ACAT together cause lowering of tissue cholesterol. [Purulia]

7. Cholesterol is essential for the digestion of lipids. [Purulia]

8. The level of LDL receptor has inverse relationship with HMG coenzyme A reductase. [Purulia]

9. Trans PUFA is contraindicated in patients suffering from atherosclerosis. [Purulia]

10. Multifunctional enzyme complex is required for fatty acid synthesis. [Purulia]

11. Impaired beta oxidation gives rise to symptoms of Hypoglycemia. [Purulia]

12. Apolipoprotein C taken from circulating HDL is essential for delivering triglycerides to the tissues and liver by various lipoproteins. [Purulia]

13. Insulin deficiency causes ketoacidosis. [Purulia]

14. Reverse cholesterol transport system mobilizes cholesterol esters to the liver by various mechanisms. [Purulia]

15. Liver is the most important organ for lipid transport and metabolism. [Purulia]

16. Propionyl CoA, a residue of odd chain fatty acid is the only glucogenic part of fatty acid. [Purulia]

17. Both uncontrolled diabetes mellitus and prolonged fasting produce ketosis but magnitude is less in prolonged fasting. [COMJNM]

18. Citrate plays an imp role in fatty acid synthesis. [MJNMCH]

19. Both hypo and hyperglycemia may lead to ketosis. [GIMSH]

20. Excessive consumption of fruits may lead to hypertriglyciredemia and hypercholesterolemia. [GIMSH]

21. Type 1 diabetes mellitus patients are more prone to develop ketosis than type 2. [JIMSH]

22. Bile acids are involved in both digestion and absorption of lipids. [JIMSH]

AMINO ACIDS, PROTEIN CHEMISTRY-DIGESTION & TISSUE PROTEINS AND PROTEIN PURIFICATION, PROTEIN METABOLISM

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

2020:

1. Classify proteins with examples. Describe how Niacin is produced from tryptophan. What is FIGLU test.(5+8+2) [COMJNM]

2. a) Why amino acid is called ampholyte?

b) Name one acidic, one basic and one hydrophobic side chain containing amino acids.

c) Describe importance of histidine residue of Hb in o2 binding.

d) Explain why ascorbic acid is used in the treatment of scurvy.

e) Describe the procedure and importance of amino acids sequencing of polypeptide chain by SANGER method.

f) Write a short note on ion exchange chromatography. (2+3+3+3+5+4) [MMCH]

3. A 4 month old female baby was brought to the OPD with the history of blackish discolouration of diapers after passing urine. This was noticed at the age of 2 and a half month. The baby was otherwise normal and healthy. She was the first issue born of a non-consanguineous marriage. There was no history of obstetric problems. On examination the baby was alert and active.

Urine sample turned black after few hours of collection.

Quantitative examination of urine revealed conc. Of Homogentisic acid in urine was 112 mg/dl.

a) Name this inborn error of metabolism

b) Pathway of synthesis of homogentisic acid and its coenzymes

c) Fate of homogentisic acid in normal babies.(1+6+4+4) [Sagore Dutta]

4. A new born urine was tested with 10% ferric chloride solution and showed olive green color giving the suspicion of presence of phenyl pyruvic acid in the urine. Serum was tested for amino acid chromatography on a TLC plate. The result shows the presence of increased amount of phenylalanine.

a) State the diagnosis of the case.

b) Write down the biochemical basis of the disorder.

c) Write down the catabolism of carbon skeleton of phenyl alanine

d) Mention the dietary treatment of the new born. (2+4+8+1) [Sagore Dutta]

5. Describe the formation of NH3 from different sources. How detoxification of NH3 takes place.(8+7) [MCK]

6. A mother brought her 20 day old female infant to the hospital with history of poor feeding, vomiting for one week, generalized convulsions and a peculiar burnt sugar smell from body and urine. Plasma and urine amino acid analysis using Tandem Mass Spectrometry disclosed marked increase in branched chain amino acids and their keto acids. There was metabolic acidosis and low bicarbonate levels.

a. What is your diagnosis?

b. Name the enzyme deficiency.

c. Enumerate the biochemical basis for the clinical and lab findings in this case.

d. Discuss the metabolism of branched chain amino acids.

e. Give a short outline of management. [1+1+3+5+2] [NRS]

2019:

7. Write in details the steps of urea cycle, along with a flow diagram. Why is blood urea important in diagnosis ofdiseases? What is uremia? (9+4+2)[BMC]

8. Discuss transamination. Describe the metabolic importance of transamination. With a flow chart describe thereactions of the urea cycle. Discus the interrelationship of urea cycle with the TCA cycle. Mention the clinical symptoms of hyperammonemia. (3+2+6+2+2)[RGMC]

9. Describe the catabolism of heme in the body in detail with an appropriate diagram. Define jaundice. Classifydifferent types of jaundice. Give a short account of the hemolytic disease of the newborn and kernicterus. (8+2+2+3) [RGMC]

10. A 40-year-old woman is brought to NRS emergency in a disoriented & confused state by her husband. Her husband gives a history of medication i.e., subcutaneous human insulin 10 units thrice daily for last 2 years. The patient displays signs of dry mouth, deep-rapid breathing & low blood pressure. Her body temperature is normal. Biochemistry laboratory investigation of blood shows following findings:

Microscopic examination of urine shows plenty of pus cells & RBCs

Serial number	Test Parameter	Patient's value	Reference interval
1.	Random Plasma glucose	473 mg/dl	<200 mg/dl
2.	3-hydroxybutytrate	257 mg/dl	<3 mg/dl
3.	Serum Urea	55 mg/dl	15-40 mg/dl
4.	HCO_3^-	12 mmol/L	22-28 mmol/L
5.	K^+	5.6 mmol/L	3.5-5.0 mmol/L
6.	Na^+	137 mmol/L	135-150 mmol/L
7.	pH	7.1	7.35-7.45

First draw a provisional diagnosis to your case. Discuss the points in favor of your diagnosis. Discuss in brief themetabolic pathway of production of 3-hydroxybutyrate in liver & why it is so raised. Recommended any additional tests you want to perform in this patient. Outline the basic emergency management of the patient. (2+5+2+3+3) [NRS]

11. A 55-year-old porter comes to emergency with slurred speech & semi-unconscious state. He was accompaniedby his wife who gives the history of chronic alcoholism for

last 15 years. His medical report i.e., liver biopsy showscirrhotic changes. On examination you find deep jaundice, ascities and low blood pressure. His laboratory reportsshow following findings:

Serial Number	Test Parameter	Patient's value	Reference interval
1.	Blood Urea	168 mg/dl	15-40 mg/dl
2.	Blood Creatinine	1.2 mg/dl	0.9-1.3 mg/dl
3.	Blood Ammonia	365 µmol/L	5-35 µmol/L

Give your provisional diagnosis. How ammonia is detoxified in our body? Discuss why the administration of Phenylbutyrate may be helpful in this condition. (2+8+5)[NRS]

12. What are Aromatic Amino Acids? Describe the metabolism of Phenyl Alanine. What are the special products ofPhenyl alanine? Discuss the synthesis of anyone of them. (2+4+4+5)[KPC]

13. Outline four orders of structure of protein with Haemoglobin as an example. Name different factors responsible for shifting of oxygen dissociation curve with their mechanisms. Differentiate between Haemoglobinopathies and Thalassemia with example. (8+5+2)[IPGMER]

14. Describe with flowchart the catabolism of Heme to produce bilirubin. Indicate in details the process of uptake,conjugation & secretion involved in the transfer of bilirubin from blood to bile. Draw labeled diagram. What is the basis of jaundice in Neonatal "Physiologic Jaundice"? (5+8+2)[SRIMSH]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

2020:

1. Write down the trans sulphuration reaction. State the process of synthesis of active methionine. Write down the reaction where active methionine is acting as a methyl donor.(4+6) [Sagore Dutta]

2. Compare and contrast the oxidative deamination catalysed by glutamate dehydrogenase and L-amino acid oxidase. Give brief outline of removal of NH3 produced by oxidative deamination.(4+6) [Sagore Dutta]

3. Flowchart of the steps of catabolism of carbon skeleton of phenyl alanine and mention the steps blocked in phenylketonuria and alkaptonuria. Write down the metabolic products of tyrosine.(5+2+3) [MJNMCH]

4. Steps of urea cycle and defects related with it. Why does homocitrullinaemia occur in ornithine translocase deficiency.(7+3) [MJNMCH]

5. A 5 year old boy with symptoms of pellagra and mental retardation .work up reveals excretion of neutral amino acid in urine. Hartnups disease was diagnosed. What is the cause of this? Give an overview of the metabolic pathway of the amino acid involved here. Explain the mental retardation and pellagra like symptoms and treatment.(2+5+3) [GIMSH]

6. Enumerate branched chain amino acids. Describe the related metabolic defect and consequences of the same.(2+4+4) [MCK]

2019:

7. A 60-year-old member of the medical faculty attended a dinner party. The next morning, he noticed acute painin the ball of great toe & redness over the skin of great toe. Physical examination revealed no overt signs of disease. The urine sample had pH of 4.5. Microscopic examination of the centrifugal sediment from the synovial fluid revealed fine crystalline material & numerous casts. 24 hr urine showed 1.52gm (9 mmol) of uric acid. The serum uric acid concentration was 11.8 mg/dl.

a) Are purines & pyrimidines required in the diet? Explain. (2)

b) Name the cause of raised uric acid level in serum in this case. (2)

c) What is the ionic form of uric acid in this patient's urine? What is its solubility? (2)

d) Uric acid level in serum & urine is dependent on metabolism of urine, explain. (4) [RPHGMCH]

8. Define dietary fibers. Enumerate the functions of dietary fibers. Explain the protein sparing action of carbohydrates in the body. State the definition of nitrogen balance. Write down the clinical significance of nitrogen balance. Compare and contrast Marasmus and Kwashiorkor. (1+2+1+1+2+3) [RPHGMCH]

9. Describe the pathway for synthesis of catecholamines in adrenal medulla with a suitable diagram. Write a brief note on parkinsonism. (7+3)[RGMC]

10. Describe the process of iron absorption from the intestine with the help of diagram. Mention the role hepcidinin iron absorption. Mention the storage from of iron. (6+2+2) [RGMCH]

11. Describe the steps of Heme degradation. Describe the subsequent fate of bilirubin in liver and intestine. (5+5) [MCK]

12. Discuss Heme synthesis in detail. [KPC]

13. Discuss the metabolism of iron. [KPC]

14. What is the role of trans-deamination in protein metabolism? Enumerate the important Biological products produced from the amino-acid Glycine and Tyrosine. (4+3+3) [RGKAR]

15. Compare and contrast the Multi Enzyme Complex System Pyruvate Dehydrogenase and Multi-Functional Enzyme System Fatty Acid Synthase. Why ketones can be synthesized by the liver but cannot be degraded there?(5+5) [RGKAR]

16. A 60 years male presented with a painless lump in the right hypochondrium, recurrent non-bilious vomiting, yellowish discolouration of conjunctiva and skin, severe itching of whole body, white frothy offensive stool, mustard oil like yellow urine, 6kg weight loss within 2 months, recurrent pain in the epigastrium radiating to theback and following are the laboratory findings-

Serum bilirubin: Total – 10.8 mg/dl, Conjugated – 9.8mg/dl, Unconjugated – 1.0mg/dl,Alkaline phosphate – 860 IU/L, AST – 81 IU/L, Gamma GGT – 122 IU/L,

Urine: Bile salt-+++, Bile pigments-+++, Urobilinogen-Nil, Bilirubin-+++,Stool – Positive for occult blood test (OBT).

Give your provisional diagnosis with proper justification. What may be the probable cause? What do you mean bycholuric jaundice and acholuric jaundice? (4+2+4)[BSMC]

SHORT NOTES (5 MARKS EACH)

2020:

1. Creatinine clearance test [Sagore Dutta]

2019:

2. Classify PEM. Enumerate few biochemical markers of Malnutrition. (3+2)[NRS]

3. Protein Energy Malnutrition.[Sagore Dutta]

4. Regulation of urea cycle [COMJNM]

5. Write a note on how urea acts as an interfering of Biuret Test. [SRIMS]

EXPLAIN WHY (4 MARKS EACH)

2020:

1. 1. Measurement of HbA1c level gives useful information about diabetes control. [Purulia]
2. 2. Glycine cannot rotate plane polarized light. [COMJNM]
3. 3.MAOI are used in the treatment of depression. [Sagore Dutta]
4. 4.Hyperammonemia and liver failure give rise to neurotoxicity, [Sagore Dutta]
5. 5.Urinary VMA excretion increase in adrenal medullary tumor. [Sagore Dutta]
6. 6.VMA is metabolic product of Catecholamine metabolism. [MJNMCH]
7. 7. many biologically important products are derived from glycine. [NRS]

2019 :

8. Proline and Glycine are helix destabilizing amino acid. [MCK]
9. Hb is better suited as O_2 transporter whereas Myoglobin as O_2 storage protein in muscle.[NRS]
10. HbA1C is now-a-days regarded as useful parameter for diagnosis & management of Diabetes Mellitus. [NRS] [MJNMCH]
11. SDS-PAGE is a useful tool to determine molecular weight of a novel protein. [NRS]
12. Impairment of Pentose Phosphate Pathway leads to erythrocyte haemolysis.[IPGMER]
13. CO prevents oxygen transport. [MMCH]
14. Acetoacetate accounts for the net production of ketone bodies. [COMJNM]
15. Phenobarbital can be used in certain cases of Neonatal Jaundice. [NRS]
16. Wilson's disease is associated with hyperuricemia. [KPC]
17. Phototherapy is treatment of choice in congenital hyperbilirubinemia.[KPC]
18. Citric Acid Cycle has both amphibolic and amphipathic roles. [RGKAR]
19. Conjugated hyperbilirubinemia is a laboratory feature of obstructive jaundice. [Sagore Dutta]
20. Levels of hepatic enzymes can differentiate between hemolytic, hepatic and obstructive jaundice. [SRIMS][MJNMCH]

VITAMINS, MINERALS AND NUTRITIONS

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

2020:

1. 1. A 7 month old baby girl was referred to OPD with failure to thrive. She was born full-term with normal birth weight. First 4 months were eventless .she was growing normally and was exclusively on breast milk. After this the mother stopped breastfeeding due to inadequate milk supply. She was then fed artificial formula milk, water and occasionally plain rice. She had no known medical illness. Her vital signs were found to be normal. She had prominent round cheeks resembling a cherubic appearance. There were no signs of pallor, severe wasting dehydration or dysmorphic features. But there was pitting edema visible in both lower limbs. Lab investigation revealed a normal full blood count but low serum proteins and albumin levels.

a) Mention the normal serum protein and albumin level.

b) Explain A/G ration

c) Compare and contrast the clinical and biochemical features of various typed of PEM

d) In which type of PEM the baby belongs

e) Explain the reason for development of pitting edema in the body. (2+1+8+1+3) [Sagore Dutta]

2. A 30 year old woman working in a call centre visited the OPD for routine checkup .Her weight was 83 kg and height 1.64m.

a) Define BMI

b) Calculate the BMI of the woman. Which BMI category does she belong to?

c) Explain the regulation of body weight through anorexigenic and orexigenic mediators

d) Define glycaemic index. Classify the food on the basis of glycaemic index

e) Define balanced diet and mention the percentage of carbohydrate, protein and fat in balanced diet.(2+2+6+2+3) [Sagore Dutta]

2019:

3. Describe the heme synthesis in a flow chart. What is the role of Vitamin-A in visual

cycle? Briefly describe therole of vitamin-K in coagulation. (5+5+5)[COMJNM]

4. Enumerate Fat soluble vitamins. Describe in details the synthesis of active vitamin D. How does Vitamin D helpin calcium homeostasis? (3+7+5)[KPC]

5. Describe the stages of absorption, transport and storage of iron in the body. Add a note on disorders associated with defective iron metabolism. (4+4+4+3)[MJNMCH]

SHORT ANSWER TYPE QUESTIONS (10 marks each)

2020:

1. Vitamin K is essential for the activation of clotting factors. Describe the mechanism why do premature neonates show clotting disorders.(6+4) [Purulia]

2. Metabolic roles of Vitamin C in human physiology. Vitamin C deficiency is said to predispose to oxidative stress. Explain. (7+3) [Purulia]

3. Why is Vit D considered as a hormone? Explain the role of calcitriol in regulation of serum Ca level.(3+7) [JIMSH]

4. Describe the function, absorption, and homeostasis of iron. [BSMC]

5. Write the dietary sources, RDA, functions and Disorders of Thiamine. [ICARE]

6. What is Balanced diet? Write the nutritional importance of dietary lipids and add a note on BMR. [ICARE]

2019:

7. By which mechanisms is calcium homeostasis maintained? Mention some sources of dietary calcium. Write thenormal blood calcium levels. (8+1+1)[BMC]

8. Describe the biochemical functions and deficiency manifestations of vitamin A. (5+5)[BMC]

9. Mention the three compounds included in retinoid. Explain the biochemical role of 11-cis retinal in the Wald's visual cycle with a flow chart. Write a brief note on Xerophthalmia. (2+6+2) [RGMC]

10. What is the active form of Vit-B6? Mention the biochemical function of this vitamin. Why Vit-B6 supplementation is necessary in a patient receiving ATD (anti-tubercular drug) Isoniazid. (INH). State its deficiency manifestation. ((1+3+3+3)[MMCH]

11. Classify the transport mechanism across the membrane. Mention the functions and

clinical disorders associated with peroxisomes. Enumerate the functions of Copper, Selenium and Iodine. Illustrate the cause and clinical features of acrodermatitis enteropathica. (2+3+3+2)[RPHGMCH]

12. Enumerate different iron-binding proteins involved in iron metabolism. Discuss the role of serum iron and TIBC. (4+3) [DHGMC]

SHORT NOTES (5 MARKS EACH)

2020:

1. How Iodine deficiency disorders of pregnancy and childhood are enthusiastically controlled and monitored by Govt. health programmes. [Purulia]
2. Role of biotin in carboxylation process. [Purulia]
3. PEM [SRIMS]
4. Biotin as a coenzyme [JIMSH]
5. Glycemic index [BSMC]

2019:

6. Hyponatremia. [KPC]
7. Pernicious Anemia. [KPC]
8. Wald's Visual Cycle. [DHGMC] [Sagore Dutta]
9. Antioxidant function of vitamin E. [Sagore Dutta]
10. Folate trap. [DHGMC] [BSMC]

EXPLAIN WHY (4 MARKS EACH)

2020:

1. Vitamin B1 is absolutely essential for oxidation of Glucose. [Purulia]
2. Deficiency of tryptophan may precipitate niacin deficiency in people who have sorghum rich diet .

[Purulia]

3. The serum level of transferrin and ferritin receptor are reciprocally regulated. [Purulia]

4. Vit E is an antioxidant. [DHGMC]

5. Thiamine deficiency is detected by measuring transketolase activity in blood. [JIMSH]

6. Kwashiorkor affects undernourished children. [RPHGMCH]

2019:

7. Vitamin D acts as a hormone. [RGMC]

8. Role of Vitamin C as an antioxidant. [MCK]

9. During prolonged war, soldiers may manifest scurvy. [COMJNM]

10. Synthesis of ferritin and transferrin receptor is reciprocally regulated. [MMCH] [MSDMCH]

11. Regulation of blood calcium levels involves several hormones. [RGKAR]

12. Vitamin K serves important roles in the synthesis of the important clotting factors. [RGKAR]

13. Patients of carcinoid syndrome presents with pellagra like symptoms. [BSMC] [IPGMR]

14. Deficiency in ascorbic acid leads to anemia. [Sagore Dutta]

15. Methotrexate inhibits the formation of Tetrahydrofolate from folic acid. [Sagore Dutta]

16. PLP deficiency can lead to pellagra like feature, explain. Explain why Vit. B12 deficiency causes functional Folicacid deficiency. (2.5+2.5) [MJNMCH]

BIOLOGICAL OXIDATION & HEMOGLOBIN

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

2020:

1. What is oxidative phosphorylation and describe briefly the mechanism of it with a diagram. Describe the various types of transport systems of membrane. (3+6+6) [COMJNM]

2. Describe the steps of heme synthesis and degradation. Discuss different types of porphyria. (10+5) [Malda] [ICARE] [2020]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

2020:

1. 1. A 11yr old boy comes to the OPD with complain of burning and pain sensation on light exposed areas, scar on the nose, reddish brown discolouration of the teeth along with features of anemia. Blood test revealed hemolytic anemia and raised protoporphyrin levels.

   a. diagnose the disorder.

   b. What type of genetic disorder is it?

   c. Name the enzyme whose activity is deficient in this disorder.

   d. What are the urinary findings? [NRS]

2019:

2. Explain the flow of electron through different components of the Electron Transport Chain with the help of adiagram and enumerate the inhibitors at different sites. (6+4) [KPC]

SHORT NOTES (5 MARKS EACH)

2020:

1. Cyt P450 [GIMSH]
2. Crigler Najjar syndrome[SRIMS]
3. Thalassemia [Malda]
4. Acute intermittent porphyria. [ICARE] [2020]

2019:

5. Inhibitors of Electron Transport System.[BMC]

6. Anion Gap [DHGMC] [MMCH]

7. Importance of biological tissue. [BSMC]

8. Compare and contrast uncouplers and inhibitors of electron transport chain with examples. Explain the uncoupling mechanism in brown adipose tissue and its clinical significance. (2+3) [RPHGMCH]

EXPLAIN WHY (4 MARKS EACH)

2020:

1. The O_2 dissociation curve of Hb and myoglobin are dissimilar. [Purulia]

2. HbF has a higher affinity for O2 than HbA. [Purulia]

3. As an adaptation to high altitude, BPG increases. [Purulia]

4. Myoglobin does not exhibit Bohr's effect. [Purulia]

5. Phenobarbitone is a better choice of treatment than phototherapy in type ii crigler Najjar syndrome. [GIMSH]

6. Obstruction of bile duct by gall stone is associated with conjugated hyperbilirubinemia. [SRIMS]

7. Urinary Urobilinogen is increased in hemolytic jaundice. [DHGMCH]

8. Brown adipose tissue promotes thermogenesis. [DHGMCH]

9. Fasting may precipitate acute intermittent porphyria. [BSMC]

10. Porphyria causes photosensitivity. [MMCH]

11. Phototherapy is the treatment of choice with neonatal jaundice. [NRS]

CLINICAL FUNCTION TEST, MEMBRANE TRANSPORT AND ENZYMES AND ECM

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

2020:

1. a) Define apoenzyme, coenzyme and holoenzyme with examples.

b) Give examples of the following types of reactions with the followings- substrate[s], enzymes and coenzymes, and products.

i)Carboxylation ii)dehydrogenation iii)transferase iv)hydrolase v)lyase

c) Describe briefly about competitive inhibition with line weaver burk plot.

d) Enzyme inhibitors may act as poisons as well as medicine. Explain

e) Write a short note on use of enzyme in laboratory medicine.(3+5+5+4+3) [MMCH]

2019:

2. Enumerate different types of Enzyme inhibition. Describe each of them with suitable examples and kinetics.(3+12) [MCK]

3. Enumerate Michaelis-Menten theory with equation of an enzyme catalyzed single substrate reaction. What ismeant by Km & Vmax & their significance? What are the different types of enzyme inhibition? Explain graphically (LWB plot) the changes in each type of reversible inhibition with suitable examples. (3+2+2+8)[MSDMCH]

4. Define Redox Potential with examples. Enumerate the members of ETC in order of redox potential. Mention the steps where proton is generated in this process. Explain the binding change mechanism with proper diagramfor ATP synthesis. Name one inhibitor of each site of the whole ETC-Oxidative Phosphorylation system. (3+2+2+5+3) [MSDMCH]

5. Explain the different strategies adopted by our body for regulation of enzymatic activities in vivo. What is meant by isoenzymes? What are the different methods adopted for identification of different isoenzymes? (10+2+3) [RGKAR]

6. Define Extracellular Matrix (ECM). Enumerate the components of ECM. Describe anyone carbohydrate component of ECM. Name the two diseases related to carbohydrate abnormality of ECM. (2+6+5+2) [MMCH]

7. Classify enzymes according to IUB classification with examples. Describe the use of

enzymes in clinical biochemistry. Define 1 IU of enzyme activity. (8+5+2) [MMCH]

8. A 45year man awoke from sleep with a painful and swollen right great toe. On the previous night he had eatena meal of fried liver along with beer, etc. Laboratory findings showed that his serum uric acid level was 8mg/dL.

a. Suggest the probable diagnosis.

b. Name the drug which is used in the treatment. Mention the enzyme inhibited and the type of inhibition in thiscase.

c. Define K_m. Elucidate competitive inhibition with a graph showing the effect of competitive inhibit9or on K_m andV_{max}. (1+3+3+1)

9.Write the key regulatory reaction of cholesterol synthesis with its clinical significance. Name two specialized compounds derived from cholesterol. Classify lipoprotein with its salient features, functions and major apoproteins. (2+1+4) [RPHGMCH]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

2020:

1. Describe the IUB classification of enzymes and various types of enzyme inhibition with examples. What is isoenzyme and what are the clinical importance of various isoenzymes of CPK.(2+5+3) [COMJNM]

2. a) Enumerate intracellular and extracellular events of collagen biosynthesis chronologically.

b) Explain the molecular basis of marfan syndrome.

c) Function of proteoglycans and glycosaminoglycans.

d) Biochemical basis of osteoarthritis.(3+2+4+1) [RPHGMCH]

3. Write the fluid mosaic model of plasma membrane; mention the transport system across plasma membrane. Write significance of Liposomes. [ICARE]

2019:

4. Explain in details the factors affecting velocity of enzyme-catalyzed reactions. State Michaelis-Menten equation. What is K_m? (8+1+1) [BMC]

5. A recently diagnosed hypertensive patient has been prescribed an ACE inhibitor

which is known to act by lowering Vmax, what is the possible mechanism of this drug? What are the various factors that affect the rate of enzyme catalyzed reactions? (4+6) [COMJNM]

6. Explain the Membrane Fluid Mosaic model with composition with a suitable diagram. Mention the process of transfer of small & large molecules across Plasma Membrane. State briefly about Aquaporins. (4+4+2) [MSDMCH]

7. What are the different functions of kidney? Discuss the use of Creatinine and Cystatin-C as biomarker of kidneyfunction. What is nephrogenic diabetes? (3+5+2) [MMCH]

8. Explain the hormonal regulation of sodium and water in our body. Enumerate our important buffer systems. Write down the role of kidney in maintaining normal blood pH. (3+3+4) [RPHGMCH]

SHORT NOTES (5 MARKS EACH)

2020:

1. Investigations required to diagnose various types of anemia. [Purulia]
2. A 37 yrs. old sailor serving in merchant navy was brought to the OPD with complains of bleeding gum, subcutaneous haemorrhage and non healing of wound. What is the probable diagnosis and the causes of symptoms. [Purulia]
3. A 45 yr old man was brought to the OPD which complains of pain in the right upper abdomen, indigestion, vomiting and weight loss. He was found to be alcoholic for last 10 yrs. On examination, the liver was enlarged, skin was dry and rough, yellowish discolouration of the sclera and edema of feet. What could be the probable diagnosis and the abnormalities in his serum analysis? [Purulia]
4. A 64 yr old man was brought to an emergency room with severe chest pain and breathlessness. His BP was 200/124mm of Hg, feeble pulse, patient was conscious. History of diabetes with alcoholism. What is the provisional diagnosis and the essential blood tests to confirm diagnosis?[Purulia]
5. A 3 yr old boy was brought to the pediatric OPD with the complains of fragile soft skin with multiple spontaneous bruising. The child has very soft skin and hypermobile joints. What is the probable diagnosis of the child? What would be the possible diagnostic tool?[Purulia]
6. Liver enzymes [GIMSH]

2019:

7. ATP binding Cassette Transporter [MSDMCH]

8. RT-PCR. [IPGMER]

9. Competitive inhibitors of enzyme used as drugs. [IPGMER]

10. Write a note on how urea is used as an interferent of Biuret test. [SRIMS]

11. Receptor-enzyme. [DHGMC]

EXPLAIN WHY (4 MARKS EACH)

2020:

1. Glycine occurs at every third position of the alpha chain of collagen. [Purulia]

2. Bicarbonate buffer and Hb act in unison in the alveolar capillaries to maintain acid base balance.[Purulia]

3. Lysine and proline are essential for the post translational modification of pre pro collagen.[Purulia]

4. Covalent cross links stabilize collagen fibers.[Purulia]

5. Receptor enzymes show intrinsic catalytic activity. [Purulia]

6. Fibrinogen to fibrin conversion is an essential step in blood coagulation. [GIMSH]

7. Flippase pattern of LDH in blood (in disease). [RPHGMCH]

2019:

8. Starvation causes metabolic acidosis. [BMC]

9. Types of jaundice can be differentiated by urine tests. [BMC]

10. Creatinine is a better parameter than urea for accessing the kidney function. [RGMC]

11. Cyclooxygenase is a suicide enzyme. [MSDMCH]

12. Enzymes may be utilized as therapeutic and diagnostic agents too. [RGKAR]

13. Levels of hepatic enzymes can differentiate between hemolytic, hepatic and obstructive jaundice. [MJNMCH] [SRIMS]

14. Determination of serum creatinine concentration in patients with hypertension is used as a marker enzyme oftarget organ damage. [SRIMS]

15. Fluoroquinolones are used in the treatment of UTI. [MJNMCH]

FREE RADICALS AND ANTIOXIDANTS, XENOBIOTICS

SHORT ANSWER TYPE QUESTIONS (10 marks each)

2020:

1. What are xenobiotics? Describe phase 2 reactions of xenobiotics.(2+8) [MCK]

2. Define buffer. Describe the different buffer system in our body along with its regulation. [ICARE]

2019:

3. Describe Cyt P450 function and its clinical signification. Give two examples of Cyt P450 dependent hydroxylation reactions where ascorbic acid is involved. Write a brief note on role of superoxide dismutase in controlling oxidative stress. (5+2+3) [SRIMS]

SHORT NOTES (5 MARKS EACH)

2020:

1. Antioxidant mechanism. [RPHGMCH]

2019:

2. Cytochrome P450. [MSDMCH] [RGMC]

3. Superoxide dismutase. [RGMC]

4. Glutathione. [MMCH]

5. Briefly discuss characteristics of Cyt P450 with its clinical importance. [RPHGMCH]

EXPLAIN WHY (4 MARKS EACH)

2019:

1. Cytochrome P450 is regarded as Xenobiotic enzyme. [NRS]

2. There are various mechanisms of protection against Free Radical in our body, explain. [RPHGMCH]

3. Superoxide dismutase protects aerobic organisms against oxygen toxicity. [DHGMC]

CELL CYCLE AND CANCER AND AIDS

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

2019:

1. Define Innate Immunity. Classify vaccines. Give two examples of live attenuated whole organism vaccines. (4+4+2) [NRS]

2. Define Tumour Marker. State the characteristics of an ideal Tumour Marker. State the role of PSA screening &determining prognosis of carcinoma. (2+4+4) [NRS]

3. Draw the structure of HIV virus with a suitable diagram. Enumerate the HIV virus replication cycle schematically with a diagram. Mention two important diagnostic tests to confirm a HIV suspected patient. (3+5+2) [MSDMCH]

4. Mention some differences between Oncogenes & Tumour suppressor genes. Enumerate the mechanisms by which oncogenes are activated by proto-oncogenes (Provide necessary diagram). (3+7) [MSDMCH]

5. Describe cell cycle with diagram. Mention the important checkpoints and the proteins involved in progressionof cell cycle. How to justify the statement that "During the S phase, DNA replicated only once"? Write in short about Apoptosis. (6+1+3) [SRIMS]

6. A little girl of 11 months had presented with several attacks of pneumonia and oral thrush. Her laboratoryreports revealed very low values of circulating lymphocytes and

immunoglobulin. What could be the diagnosis and what is the cause of the disease? What is cell mediated and humoral immunity? Give suitable diagrams. How they work together? Why people living with HIV and AIDS (PLHA) are immunocompromised? (2+5+3)[SRIMS]

7. Mention the different mechanisms of proto-oncogene activation with appropriate examples. Compare and contrast cellular and humoral immunity. (5+5) [RPHGMCH]

8. Describe the different modes of conversion of proto-oncogene to oncogene. Why p53 is known as the guardian of the human genome? Describe briefly, some uses of tumor markers. (4+3+3) [DHGMC]

SHORT NOTES (5 MARKS EACH)

2019:

1. Define Apoptosis. What are Caspases? (2+3) [NRS]

2. Ribozyme. [MSDMCH]

3. Monoclonal antibody. [DHGMC]

EXPLAIN WHY (4 MARKS EACH)

2020:

1. Increased chances of carcinogenesis occur with simultaneous intake of alcohol and smoking. [SRIMS]

2. Tumor markers are more suitable in monitoring treatment course than a diagnostic tool. [BSMC]

2019:

3. Endoplasmic Reticulum is involved in detoxification process. [COMJNM]

4. Proto-oncogenes are regulatory genes. [COMJNM]

MOLECULAR ENDOCRINOLOGY AND SIGNAL TRANSDUCTION

LONG ANSWER TYPE QUESTIONS (15 MARKS EACH)

1. Describe the structure of insulin. Give a brief account of its mechanism of action. (4+6) [BSMC][2019]

SHORT ANSWER TYPE QUESTIONS (10 MARKS EACH)

2020:

1. What is the metabolic roles of folic acid in one carbon metabolism and role of vitamin K in post translational modification.(5+5) [COMJNM]
2. Discuss the steps of catecholamine synthesis & breakdown. [Malda][2020]

2019:

3. What are second messengers? Describe the action of CAMP second messenger. (2+8) [KPC]

SHORT NOTES (5 MARKS EACH)

1. Signal peptide. [DHGMC] [2019]

EXPLAIN WHY (4 MARKS EACH)

2020:

1. cGMP is the 2nd messenger in the events that characterize smooth muscle relaxation.[Purulia]

2. Glucagon and epinephrine inhibits lipogenesis. [Purulia]

3. Insulin stimulated lipogenesis by several mechanisms. [Purulia]

4. Osteoporotic changes of bones is a common association in patients with chronic renal failure. [Purulia]

5. Hypothyroidism is associated with high serum TSH and low T4 conc. [Sagore Dutta]

2019:

1. cAMP acts as a second messenger in the signal transduction pathway. [RGMC]

2. Phase II drug metabolism involves several types of conjugation reactions. [RGKAR]

3. Calcium is a mediator of hormone action. [DHGMC]

4. Insulin is an anabolic hormone. [DHGMC]

AETCOM MODULE QUESTIONS

1. Cadaveric oath. [MMCH] [RPHGMCH]

2. Doctor patient relationship. [ICARE]

3. Note on The AETCOM module on clinical biochemistry. [BMC]

4. Cadaver is our first teacher-explain. [RGMC] [MJNMCH] [BMC] [MSDMCH] [KPC] [IPGMER] [BSMC] [NRS] [SRIMS]

5. Notes on Roles of an IMG. [RGMC] [RPGMCH] [MMCH]

6. Note on Approach to disclose bad news to relatives of a cancer patient. [MCK]

7. Patient as a teacher to learn medicine. [MCK]

8. Note on Commitment to lifelong learning. [COMJNM]

9. "Trust is very important among doctor-patient relationship" – Explain the statement citing an imaginary situation. [NRS]

10. RT-PCR is a diagnostic tool to detect Corona virus infection-explain. [MSDMCH]

11. Importance of continuous learning-write a note. [KPC]

12. Explain how to communicate with an ignorant person that they need hospital admission. [KPC]

13. Discuss the duties of a doctor & rights of a patient in a doctor – patient relationship. [RGKAR]

14. What are your responsibilities as a doctor regarding creation of awareness of COVID-19 in your community? [RGKAR]

15. For what type of medical negligence, can a doctor be summoned by a court in respect of Consumer Protection Act (CPA)? [RGKAR]

16. How will you expose a bad news (death or deterioration of prognosis) to a patient party? [RGKAR]

17. What are the common barriers that one doctor faces while communication his/her patients? [IPGMER]

18. List the essential elements of building a good communication skill. [IPGMER]

19. Explain the role of communication skill in preparing a patient for blood collection for fasting glucose estimation. [IPGMER]

20. Write a note on Kalamazoo consensus statement which provides a working model for teaching communication skills. [SRIMS]

21. Explain why - Class switching occurs during immune responses. [SRIMS]

22. Short note: You want to perform GIT operation. How do you proceed to convince & assure the patient? (2.5+2.5) [MJNMCH]

23. Role of a 1st year medical student to motivate people for cadaver donation.[BSMC] [MCK][BMC]

24. Handling a wet specimen [BSMC]

25. Duties / responsibilities of a doctor. [DHGMC] [SRIMS]

26. Clinical empathy [RGKAR]