001/23

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation), Nov-Dec 2023

Subject: Anatomy
Paper : I

Full Marks : 100
Time: 3 hours

Attempt all questions. The figures in the margin indicate full marks.

1. a) An young male suffered a road traffic accident and came to the emergency. On clinical examination, he was in a state of shock with severe pallor, tense abdomen, patchy ecchymosis on the left hypochondrium with fracture lower ribs on the left side. He was immediately shifted for emergency laparotomy.

i) What is the provisional underlying cause of this clinical condition?

ii) What is the blood supply of the affected organ?

iii) What are the important ligaments attached to the affected organ?

iv)What is the source of development of the affected organ and the ectopic sites where they may be found?

v) Post operatively he was found to have high blood glucose level. What may be the cause of this condition? 1+6+4+3+1

b) A 50 year old man fell down from the stairs resulting in severe pain in the right shoulder. He was taken to the Orthopedic OPD. On examination, he was seen to support his right elbow with his left hand. The right shoulder revealed loss of normal rounded contour and loss of cutaneous sensations in the lower half of the deltoid region. Any kind of movement around the shoulder was very painful.

Explain the condition from your knowledge of anatomy. What is the cause of loss of normal contour of the shoulder? Why there is loss of cutaneous sensation in the lower half of deltoid region? Enumerate the ligaments of the shoulder joint. How the stability of the joint is maintained? Discuss the mechanism of elevation of arm above head. Which type of dislocation of shoulder joint is common and why? 2+2+1+3+2+3+2

2. a) What is Intra-embryonic mesoderm? What are the derivatives of I.E.M.? Name any three structures derived for IEM. Name the derivatives of intra-embryonic coelom. 2+3+3+2

b) Draw and label the histological structure of spleen and lymph node. Compare their histological features. 4+4+2

c) A 45 year old female, known case of SLE (autoimmune disease) is on immune suppressants for last 2 years, presented with cough and breathlessness, no fever. Chest radiography showed right sided pleural effusion and physician planned for thoracocentesis (removal of fluid). 2+4+2+2

i) What would be the preferred site for this procedure and why?

ii) Write in brief about subdivisions and innervation of parietal pleura.

iii) What are embryonic sources of the different layers of pleura?

iv) What is pulmonary ligament and its function?

3. Write a short notes on the following: 2x5

a) Cadaveric Oath.

b) Tests for ovulation.

4. Explain the following statements: 5x4

a) A small segment of oesophagus may be differentiated from that of duodenum by histological studies.

b) A tailor presents with diffuse swelling of the palm after a needle prick over the tip of the little finger.

c) Prognosis of coronary artery diseases are better in old age than young.

d) Cancer of prostate may metastasise to vertebral column.

e) Conceptus is not rejected by its mother.

5. Choose the correct option for each of the following: 10x1

i) All of the following are lateral branches of abdominal aorta except-
a) Inferior phrenic artery b) Superior phrenic artery
c) Renal artery d) Gonadal artery

ii) All are tributaries of coronary sinus of heart except-
a) Great cardiac vein. b) Anterior cardiac vein.
c) Small cardiac vein. d) Middle cardiac vein.

iii) A tumour affecting the upper lobe of lung may produce all except:

a) Venous engorgement and odema of the face and upper limb.
b) Paralysis of the hemidiaphragm.
c) Increased breath sound on affected side.
d) Decreased radial pulsation at the wrist.

iv) What are the three types of fibres present in the connective tissue?

a) Collagen, elastic and neurofibrils b) Collagen, elastic and myofibrils
c) Collagen, elastic and reticular d) Elastic, reticular and osteoblasts

v) Which of the following statement is true about osteocyte:

a) 2 or 4 osteocytes are present in each lacuna.
b) They are derived from osteoclast.
c) They are responsible for reabsorption of bone.
d) Neighbouring osteocytes are in contact with each other through cytoplasmic extension.

vi) Your teacher has demonstrated the specimen of testis with spermatic cord and noticed interior of testis. Spermatogenesis is transformation of:

a) Spermatogonium into primary oocyte.
b) Primary spermatocyte into secondary spermatocyte.
c) Secondary spermatocyte into spermatid.
d) Spermatid into sperm.

vii) The most common type of diaphragmatic hernia in infant is;
a) Bochdalec hernia b) Morgagni hernia
c) Sliding hernia d) Paraesophageal hernia

viii) Select the incorrect statement about the wrist joint:

a) Its upper articular surface is formed by radius and ulna.
b) Its lower articular surface is formed by scaphoid, lunate & triquetral bone.
c) It is an ellipsoidal joint.
d) It permits free rotator movements.

ix) What unique features in the wall of the urinary bladder wall allow it to stretch to increase volume:

a) Thicker smooth muscle layers in the wall.
b) Thicker connective tissue in the lamina propria.
c) The presence of membrane plaques in the superficial cells.
d) Increased number of desmosomes and junctional complexes.

x) Anorectal ring receives contribution from all except:
a) Sphincter ani externus b) Sphincter ani internus.
c) Iliococcygeus d) Puborectalis.

001/23

The West Bengal University of Health Sciences

MBBS 1st Professional Examination (New Regulation), Nov-Dec 2023

Full Marks : 100
Time : 3 hours

Subject: Anatomy
Paper : II

*Attempt **all** questions. The figures in the margin indicate full marks.*

1. a) A 7 year old child was complaining of recurrent upper respiratory tract infection and was inattentive in class. He was diagnosed to be suffering from otitis media with effusion.
   i) Which anatomical area is affected?
   ii) What is the boundary and content of the above area? Explain with diagram.
   iii) Where will you make an incision as a surgeon to drain the effusion if required? Justify with reasons.
   iv) Describe the intratemporal course of the facial nerve.
   v) What is the source of development of the affected area? 1+(3+3)+ (1+2)+4+1

   b) Following an operation of right parotid gland, a patient develops weakness of facial muscles of that side. State the relations of the affected cranial nerve with respect to the parotid gland. Give a brief account of the functional components with nuclei, branches and distributions of the nerve. Enumerate the features of LMN type of palsy of the nerve with explanation. 3+(2+2+2)+6

2. a) A child was brought to ophthalmology OPD for constant watering of one eye.
   i) Explain the anatomical causes of this symptom.
   ii) Enumerate the structures forming lacrimal apparatus.
   iii) Prepare a flow chart of the secretomotor pathway to lacrimal gland. 2+4+4

   b) A male baby is presented with varicosity of veins in lower limb.
   i) Name the superficial veins draining the lower limb.
   ii) What is fate of these veins?
   iii)Name the main tributaries of their superficial vein. 2+2+6

   c) What is karyotyping? What is main genetic defect of Klinefelter's syndrome? Enumerate the symptoms of the syndrome. 2+2+6

3. Write a short note on the following: 2x5
   a) Aneuploidy.
   b) Ciliary ganglia.

4. Explain the following statements: 5x4
   a) The composite development of tongue is confirmed by studying the sensory innervations.
   b) Haemophilia carrier mother may have a sufferer son.
   c) Tumor of inferior parietal lobule may lead to sensory aphasia.
   d) Thyroid enlargement fails to rise above thyroid cartilage and it moves up and down with deglutition.
   e) Ankle sprain usually occurs when the foot is planter flexed.

P.T.O

5. Choose the correct option for each of the following: 10x1

i) Sinus of Morgagni transmits all except
a) Auditory tube b) Ascending palatine artery
c) Tensor veli palatini d) Palatine branch of Aascending pharyngeal artery

ii) A fish bone got stuck in right vallecula was removed with prolonged effort causing laceration of tissue. Which nerve will carry the pain sensation from this area?
a) External laryngeal nerve b) Internal laryngeal nerve
c) Glossopharyngeral nerve d) Hypoglossal nerve

iii) Waddling gait is due to:
a) Bilateral paralysis of gluteus maximus.
b) Unilateral paralysis of gluteus medius.
c) Bilateral paralysis of gluteus medius and minimus.
d) Unilateral paralysis of tensor fascia lata.

iv) Regarding passavant's ridge all true except:
a) It contains horizontal fibres of palatopharyngeus muscle.
b) It closes oropharyngeal isthmus.
c) It is positioned at the level of lower border of C1.
d) Paralysis of its muscles cause nasal regurgitation.

v) Nucleus Ambiguus contributes to the fibres of the following cranial nerve except:
a) Accessory nerve. b) Vagus nerve.
c) Glossopharyngeal nerve. d) Facial nerve.

vi) The last tributary of left internal jugular vein is
a) Lingual vein b) Middle thyroid vein c) Occipital vein d) Thoracic duct

vii) A child at the age of 10 year is presented to your office with abnormal twisting of the neck towards right side, the chin is pointed to other direction, unable to rotate his neck. Based on the knowledge of first professional anatomy, which part is involved?
a) Anterior strap muscles of neck. b) Right side of sternocledomastoid muscle.
c) Left side of sternocledomastoid muscle. d) Contracture of platysma.

viii) In general OPD a mother has come with her child of four years. The child is crying with high fever. On inspection the right tibia is swollen red hot mimicking acute signs of inflammation. On deep palpation around the knee, the baby is crying more. Mother gave past history of sore throat. On the basis of anatomy knowledge where is the problem?
a) Around the knee b) Epiphysis c) Metaphysis d) Diaphysis

ix) Select the incorrect statement regarding the Spinal accessory nerve:
a) It emerges in the posterior triangle by piercing the posterior border of sterno-cleidomastoid muscle.
b) It is related to lymph nodes belonging to upper deep cervical lymph node.
c) It runs parallel to the fibres of scalenus medius.
d) It supplies sterno-cleidomastoid and trapezius muscle.

x) Posterior surface of epiglottis is lined by:
a) Pseudo stratified ciliated columnar epithelium.
b) Non keratinized stratified squamous epithelium.
c) Pseudo stratified ciliated columnar and non keratinized stratified squamous epithelium.
d) Stratified columnar epithelium.

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation), Nov-Dec 2023

Subject: Physiology **Full Marks: 100**
Paper: I **Time: 3 hours**

Attempt all questions. The figures in the margin indicate full marks.

1. a) A 65 year old patient is admitted with severe shortness of breath which increases in recumbent position. He gives history of weakness and exercise intolerance. On examination his blood pressure is 180/110 mm of Hg, heart rate is 120 beats/min and bilateral basal crackles are present. ECG is showing left ventricular hypertrophy but no ischaemic changes. 1+3+5+6

i) What is your diagnosis?
ii) What is the cause of shortness of breath in this patient?
iii) Explain with diagram the pressure and volume changes in the left ventricle in different phases of cardiac cycle in this patient.
iv) Illustrate the short term and long term compensatory mechanisms activated in the body of this patient.

b) A group of third year medical students accompanied a medical mission team to Peru. After arrival at the airport, they hiked quickly towards a remote mountain village in the Andes at a height of 18000 ft. They started suffering from headache, dizziness, nausea and shortness of breath. What is your diagnosis? What are the causes of the above mentioned symptoms? What is acclimatization? What are the compensatory changes of acclimatization? What is Monge's disease? 1+3+2+8+1

2. a) What are the constituents of pancreatic secretion? Explain the role of enteric hormones in controlling pancreatic secretion. Why 'Acute pancreatitis' is an emergency medical condition and can be fatal? 4+4+2
b) What is Lymph? Write about the formation and composition of lymph. What are the functions of lymph? 2+4+4
c) Discuss the etiology, clinical features and treatment of Myaesthenia Gravis. How does it differ from Eaton-Lambert syndrome? 3+2+2+3

3. Write short notes on the following: 2x5
a) Significance of empathy.
b) Resting membrane potential.

4. Explain the following statements: 5x4
a) Atropine does not inhibit vagus induced gastrin release.
b) Calcium is a membrane stabilizer.
c) Digitalis act as a positive inotropic agent.
d) Tight cervical collar can result in a syncopal attack.
e) Coagulation disorder occurs in obstructive jaundice.

P.T.O

10x1

5. Choose the correct answer of each of the following:

i) Which of the following are also known as Exchange Vessels?
a) Precapillary sphincters b) Capillaries
c) Arterioles d) Venules

ii) All are true about T-wave inversion except:
a) Indicates myocardial ischemia. b) May be present in Leads V1 and V2 in normal persons.
c) It is the earliest change seen following Myocardial infarction.
d) May occur with bundle branch blocks.

iii) All are true of enteric nervous system except:
a) The Meissner's plexus is located between the circular muscle layer and mucosa.
b) Myenteric plexus situated between the circular and longitudinal muscles control the intestinal secretions.
c) In Hirschsprung's disease there is absence of both the Myenteric and Meissner's plexus.
d) Neurotransmitters of enteric nervous system are ATP, NO and GABA.

iv) Regarding spirometry tests done to assess lung function, all are true except:
a) Measuring timed vital capacity can help diagnose obstructive disorders.
b) Residual volume is difficult to measure by this method.
c) Flow-volume loop shows no change in restrictive disorders.
d) Vital capacity changes with posture.

v) RBC count is less in young females compared to males of same are because:
a) Increased blood loss during menstruation.
b) Females are less active and less muscular than the males.
c) Oestrogen inhibits erythropoiesis. d) Low thyroxine levels.

vi) Wolff Parkinson White syndrome is characterized by:
a) Prolongation of PR interval. b) QRS deflection shortens with slurred up stroke.
c) Presence of irritable ectopic focus in the ventricle.
d) Normal PJ interval.

vii) Dysbarism is caused by:
a) Increased partial pressure of carbon dioxide in blood.
b) Decreased partial pressure of carbon dioxide in blood.
c) Decreased partial pressure of nitrogen in blood.
d) Increased partial pressure of nitrogen in blood.

viii) Following are the graded potentials except:
a) End plate potential. b) Receptor potential.
b) Pacemaker potential. d) Action potential.

ix) Cholagogues are the substances which cause-
a) Increased secretion of bile. b) Contraction of gall bladder.
c) Increased concentration of bile. d) Solubility of fats in micelles.

x) Carotid body has a blood flow of:
a) 500ml/100gm/min b) 1000ml/100gms/min
c) 1500ml/100gms/min d) 2000ml/100gms/min

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation), Nov-Dec 2023

Subject: Physiology **Full Marks : 100**
Paper : II **Time : 3 hours**

*Attempt **all** questions. The figures in the margin indicate full marks.*

1. a) A 60-year-old male is suffering from difficulty in initiation of any motor activity. While sitting he is having tremor in his hand which stops during any activity. Doctors also noted, along with change of emotions, there is no change in facial expression.
   i) What is your probable diagnosis?
   ii) Explain the pathophysiology of the disease with a diagram.
   ~~iii) Explain the pathophysiology of the disease with a diagram.~~ (*)
   iv) Name two drugs used to reduce hypokinesia in this patient.
   v) What type of rigidity is seen in this patient and how does it differ from the rigidity of upper motor neuron lesion? 1+6+3+2+3

   b) A 45 year old woman presented with buffalo hump, moon face, purple striae over abdomen, weight gain, poor healing of wounds. X-ray showed fracture of vertebrae. Fasting blood sugar level was – 160 mg/100 ml of blood.
   i) What is the most probable endocrine disorder in the woman?
   ii) Explain the mechanism of development of clinical features in the patient.
   iii) Describe physiological actions of the hormone responsible for this condition.
   iv) Name two investigations required for confirmation of clinical diagnosis. 1+4+8+2

2. a) Explain the mechanism of sound transduction in the Ear. What are the types of deafness and how would you differentiate between them by tuning fork tests? 7+3

   b) Describe various mechanisms of sodium and water reabsorption in renal tubules. What are diuretics? 4+4+2

   c) Discuss the various hormonal changes that take place in ovarian cycle. 10

3. Write short notes on the following: 2x5
   a) Micturition reflex.
   b) Referred pain.

4. Explain the following statements: 5x4
   a) Polyuria, polyphagia and polydipsia are the cardinal signs of Diabetes.
   b) NREM sleep is known as slow wave sleep.
   c) Vertigo is a common symptom of inner ear disease.
   d) UMN lesion is characterized by increased muscle tone in anti gravity muscles and exaggerated deep tendon reflexes.
   e) Inulin clearance test reflects GFR.

P.T.O

(*) iii) What is the physiologic basis of hyperkinesia in this patient?

5. Choose the correct answer of each of the following: 10x1

i) All are the features of pain pathway except:

a) Neospinothalamic pathway consists of A^{δ} fibres.
b) C-fibres end in lamina I and V.
c) Pain sensation from face are carried by the 5th cranial nerve.
d) Paleospinothalamic pathway transmits slow pain.

ii) In the absence of vasopressin, the greatest fraction of filtered of water is absorbed in the:

a) Proximal tubule. b) Loop of Henle.
c) Cortical collecting duct. d) Medullary collecting duct.

iii) All are true of memory except:

a) Prefrontal cortex plays a role in formation of working memory.
b) NMDA receptors play a role in development of short term memory.
c) Role of nitric oxide in potentiating long term memory has been seen.
d) Reverberatory circuits are involved in short term memory.

iv) During childbirth, a woman suffers a serious haemorrhage and goes into shock. After she recovers, she displays symptoms of hypopituitarism. Which of the following will not be expected in this patient?

a) Cachexia b) Infertility
c) Pallor d) Stress intolerance

v) What is the clearance of a substance when its concentration in the plasma is 10mg/dl, it's concentration in urine is 100 mg/dl, and urine flow is 2 ml/min?

a) 2ml/min. b) 10ml/min.
c) 20ml/min. d) 200ml/min.

vi) Which of the following is least likely to contribute to the beneficial effects of angiotensin-converting enzyme inhibitors (ACE-inhibitors) in treatment of heart failure?

a) Vasodilatation b) Decreased cardiac growth
c) Decreased cardiac afterload d) Decreased plasma renin activity

vii) A 50 year old woman undergoes a neurologic exam that indicates loss of pain and temperature sensitivity, vibratory sense and proprioception of left leg. These symptoms could be explained by:

a) A tumor on the right medial lemniscal pathway in the sacral spinal cord.
b) Peripheral neuropathy.
c) A tumor on the left medial lemniscal pathway in the sacral spinal cord.
d) A tumor affecting right posterior paracentral gyrus.

viii) Following are the tests for detecting defects in colour vision except:

a) Ishihara Chart. b) Edridge Green Lantern Test.
b) Holmgren's Wool Matching Test. d) Snellens's Chart.

ix) Purkinje fibres are inhibitory to:

a) Deep cerebellar nuclei b) Climbing fibre
c) Basket cells d) Spinocerebellar tracts

x) Which set of hormones have nuclear receptor:

a) Oestrogen, thyroxin, glucagon b) Oestrogen, TSH, GnRH
c) Oestrogen, cortisol, testosterone d) Thyroxin, LH, GH

001/23

The West Bengal University of Health Sciences

MBBS 1st Professional Examination (New Regulation), Nov - Dec 2023

Subject: Biochemistry **Full Marks : 100**

Paper : I **Time : 3 hours**

Attempt all questions. The figures in the margin indicate full marks.

1. a) A 23-year-old male was brought to the emergency in semiconscious state. His mother gave history of diagnosis of malaria confirmed by identification of parasites in blood smear and subsequent treatment with Primaquine by his family physician. He was also passing dark coloured urine. On examination, he had fever, extreme pallor, severe jaundice, tachycardia and low BP. His sclera was yellow and his spleen was enlarged.
   i) What is your provisional diagnosis and why?
   ii) Explain the biochemical basis of the findings in this patient.
   iii) Outline the metabolic pathway that is defective in this case.
   iv) Mention two important functions of this pathway.
   v) Add a note on glutathione and its role in the body. 2+4+4+2+3

   b) A 8 year old boy has serum LDL 230mg/dl, HDL 35 mg/dl, VLDL 25 mg/dl, Triglycerides 126 mg/dl. His brother and father had isolated increased LDL cholesterol.
   i) What is your provisional diagnosis?
   ii) Discuss the Fredrickson classification of hyperlipoproteinemia.
   iii) Mention in a flow diagram, the cholesterol synthesis up to mevalonate.
   iv) Name a lipid lowering agent with its mechanism of action. 2+5+5+3

2. a) Describe the mitochondrial electron trans port chain with diagram. Name the inhibitors of different complex of electron transport chain. 6+4
   b) Write down the chemical name of carnitine. Describe the role of carnitine in Beta oxidation of fatty acids. How is it regulated? What are the symptoms of carnitine deficiency? 1+3+3+3

   c) A 50 year old man was admitted to hospital with complaint of persistent vomiting. On examination, he was found dehydrated and the respiration was shallow. He gave past H/O dyspepsia. The result of the laboratory investigations are as follows:

Parameter	Obtained Value
Blood pH	7.72
Plasma HCO_3	45mmol/L
pCO_2	60mmHg
Na^+	140 mEq/L
K^+	2.5 mEq/L
Urine	Acidic

   i) Interpret the report and give a probable diagnosis based on acid base disorder.
   ii) Explain the compensatory phenomenon going on in this state.
   iii) Explain briefly the cause of hypokalemia with excretion of acidic urine in this patient. 5+2+3

3. Write short notes on the following: 2x5
   a) Doctor as lifelong learner.
   b) Write down the significance of glycosaminoglycans in health.

P.T.O

4. Explain the following statements: 5x4

a) Physical techniques are used to isolate subcellular organelles.
b) The chemiosmotic theory explains the mechanism of oxidative phosphorylation.
c) The oxygen dissociation curve for myoglobin and haemoglobin suit their respective physiologic roles.
d) Aspartate transcarbamoylase is an allosteric enzyme.
e) Homocysteine is related to atherosclerotic vascular disease and thrombosis.

5. Choose the correct option for each of the following: 10x1

i) When blood glucagon rises, which of the following hepatic enzyme activities fall:
a) Protein kinase
b) Glycogen synthase
c) Glycogen phosphorylase
d) Adenylyl cyclase

ii) An important Zn containing enzyme is:
a) Carbonic anhydrase
b) Isocitrate deydrogenase
c) Choline esterase
d) Lipoprotein lipase

iii) Allosteric activator of CPS I is:
a) Fructose -2, 6 bisphosphate
b) Citrate
c) N- acetyl glutamate
d) Malonyl CoA

iv) In hospital, used cotton should be discarded in:
a) Yellow bag
b) Red bag
c) White container
d) Blue container

v) Acute intermittent porphyria occurs due to deficiency of:
a) Uroporphyrinogen I synthase
b) Uroporphyrinogen III synthase
c) Uroporphyrinogen decarboxylase
d) Protoporphyrinogen oxidase

vi) The enzyme commonly used in the estimation of plasma glucose level from a blood sample is:
a) Glucose oxidase
b) Glucose-6-phosphatase
c) Glucose-6-phosphate dehydrogenase
d) Glucokinase

vii) All are true about thermogenin except:
a) It is a type of adipose tissue.
b) It produces heat.
c) It is rich in mitochondria.
d) It stops electron flow in ETC.

viii) Which phenomenon is not related to functional properties of hemoglobin?
a) Bohr effect
b)Haldane effect
c) Pasteur effect
d) Donnan effect

ix) Marker enzyme for peroxisome is:
a) Glucokinase
b) ATP Synthase
c) 5 nucleotidase
d) Uric acid oxidase

x) Which statement is false?
a) CKD may cause decreased calcium absorption from intestine.
b) CKD may cause anemia.
c) CKD may be present in patients with normal GFR.
d) Renal replacement therapy may be necessary in advanced CKD.

001/23

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation), Nov - Dec 2023

Subject: Biochemistry
Paper : II

Full Marks : 100
Time : 3 hours

Attempt all questions. The figures in the margin indicate full marks.

1. a) A 5 year old boy presented with blistering photosensitive lesions diagnosed as xeroderma pigmentosa.
   i) What is the molecular basis of this disorder?
   ii) Write a note on different agents of DNA damage.
   iii) Enumerate any six types of DNA repair methods.
   iv) Name the prokaryotic DNA polymerases involved in DNA repair.
   v) Name the eukaryotic DNA polymerases with their roles. 2+3+3+3+4

   b) Outline with diagram the process of elongation phase of translation in prokaryotes. Add a note on inhibitors of translation with examples. Mention three types of post-translational processing. Classify mutation. Explain the consequence of point mutation with a suitable example. 4+3+3+2+3

2. a) Enumerate the dietary sources of iron. Outline the mechanism of absorption, transport and storage of iron in the body. Mention two common causes of iron deficiency anemia. Outline the clinical manifestations and principle of treatment of iron deficiency anemia. 2+3+2+2+1

   b) Define xenobiotic. Describe the different phases of xenobiotic metabolism with proper examples. 2+8

   c) Draw the structure of an immunoglobin molecule and mention following regions:
   i) Amino & carboxy terminal, ii) –S-S- linkages, iii) Fab & Fc segment, iv) Papain & pepsin cleaving sites, v) Variable & constant region, vi) Antigen binding site.
   Explain briefly: Constant regions determine class specific effector functions of an immunoglobin. 6+4

3. Write short notes on the following: 2x5
   a) P53 tumour suppressor gene.
   b) RNA editing.

4. Explain the following statements: 5x4
   a) Post translational modification of collagen confers strength and rigidity.
   b) Restriction endonuclease show different cleavage patterns.
   c) Philadelphia Chromosome in CML is an example of Chromosomal translocation.
   d) Apoptosis is very important for preventing cancer.
   e) Following vegan diet strictly may lead to vitamin B12 deficiency.

5. Choose the correct option for each of the following: 10x1

i) Parathormone is required for the conversion of:

a) Cholecalciferol into 1-OH-cholecalciferol
b) Cholecalciferol into 25-OH-cholecalciferol
c) 25-OH- cholecalciferol into calcitriol
d) Cholesterol into 7-dehydroxycholecalciferol.

ii) Co-factor for conversion of d-UMP to TMP is:

a) SAM
b) Folate
c) B12
d) Niacin

iii) Example of monomeric enzyme of E. coli with more than one active sites:

a) DNAP I
b) DNAP II
c) DNAP III
d) DNAP IV

iv) Rifampicin acts by inhibiting prokaryotic:

a) Translation
b) Cell wall synthesis
c) Replication
d) Transcription

v) Eukaryotic RNA polymerase III synthesizes:

a) mRNA.
b) snRNA.
c) 28 S rRNA.
d) 5 S rRNA

vi) All manifestations are seen in Lesch-Nyhan syndrome except:

a) Self-mutilation
b) Immunodeficiency
c) Hyperuricemia
d) X-linked inheritance

vii) Which mineral is required for the formation of supersecondary protein structure that allows binding to DNA:

a) Iron
b) Selenium
c) Molybdenum
d) Zinc

viii) Many antimicrobials inhibit translation, which of the following antimicrobial is correctly paired with its mechanism of action?

a) Erythromycin binds to 60s ribosomal subunit
b) Puromycin inactivates elongation factor 2
c) Streptomycin binds to the 30s ribosomal subunit
d) Tetracyclines inhibit peptidyl transferase

ix) Example of oncofetal antigen is:

a) AFP
b) hCG
c) Alpha 1 antitrypsin
d) p53

x) Inosinic acid is the biological precursor of:

a) Uracil & thymine
b) Orotic acid & uridylic acid
c) Adenylic acid & guanylic acid
d) Purines and thymine