001/24

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation), November - December 2024

Subject: Anatomy
Paper : I

Full Marks: 100
Time: 3 hours

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

1. a) A middle aged lady presents with indigestion, dyspepsia and burning pain in the right upper quadrant of her abdomen, which is also referred to the tip of her right shoulder. Using your knowledge of anatomy, answer the following: 1+2+6+4+2

   i) Which organ is most likely to be affected?
   ii) Mention its blood supply.
   iii) Mention the structures/organs related to the visceral surface of the liver.
   iv) Describe briefly the histology of liver.
   v) Name the structures passing through the Porta hepatis.

   b) A child is brought to the orthopedics OPD with acute severe trauma to the elbow, with a palpable bony lump in the cubital fossa and elbow in midprone position with inability to move the joint. 3+6+3+3
   i) Explain the above situation.
   ii) Describe the joints of pronation and supination under the following headings: types of joints, ligaments attached, muscles acting and the mechanism of movements produced.
   iii) Name the blood supply and nerve supply to these joints.
   iv) What is tennis elbow and golfers elbow?

2. a) Write down the histological features of trachea. Draw a suitable diagram. 5+5

   b) A bulky mass covered with membrane was detected in umbilical cord of newborn. What is this anomaly? Discuss the rotation of gut during development and reason of this anomaly. Give an outline of malformations related to Vitello intestinal duct. 1+4+2+3

   c) What is spermiogenesis? What is capacitation and what is its importance? What will happen if there is no zona reaction? What are the main results or fertilization? What is ectopic implantation? 1+2+2+3+2

3. Write short notes on the following: 2x5
   a) General plan of histology of gastro intestinal tract with diagram.
   b) Role of physician in body donation after death.

4. Explain the following statements: 5x4

   a) Fracture of the scaphoid of the wrist is often associated with avascular necrosis of the proximal segment.
   b) Implantation is initiated when the blastocyst comes into contact with the uterine wall.
   c) Pectinate line is an important landmark of anal canal.
   d) Osteoblasts are buried alive.
   e) Ureteric colic may radiate from loin to groin.

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

i) Enzyme secreted by a sperm which helps in its penetration into the ovum:
a) Protease. b) Hyaluronidase.
c) Carboxylase. d) Dehydrogenase.

ii) Axillary sheath is derived from:
a) Investing layer of deep cervical fascia. b) Pretracheal layer of deep cervical fascia.
c) Prevertebral layer of deep cervical fascia. d) Pectoral fascia.

iii) Remnants of mesonephric tubules / duct include all except:
a) Paroophoron. b) Epioophoron.
c) Duct of Gartner. d) Colliculus seminalis.

iv) Each of these muscles is inserted on first rib except:
a) Scalenus anterior. b) Scalenus posterior.
c) Scalenus medius. d) Latissimus dorsi.

v) All are tributaries of portal vein except:
a) Superior mesenteric vein. b) Right gastric vein.
c) Inferior mesenteric vein. d) Inferior hemiazygos vein.

vi) Mammary glands are formed from:
a) Neural crest. b) Ectoderm.
c) Endoderm. d) Mesoderm.

vii) The large intestine is characterized by the following:
a) Well developed plica circularis.
b) Numerous sub mucosal glands.
c) Deep intestinal glands and predominance of goblet cells.
d) Numerous peneth cells in intestinal glands.

viii) Which of the following statements regarding interossei of the hand is true?
a) They arise from tendons of flexor digitorum profundus.
b) They flex metacarpophalangeal joints and extend interphalangeal joints.
c) Palmar interossei cause abduction.
d) Palmar interossei have 2 heads of origin.

ix) True regarding urinary bladder is:
a) The act of micturition is exclusively under the control of sympathetic nerves.
b) The trigonal muscle is supplied by the sympathetic nerves.
c) The act of micturition is under the control of both sympathetic and parasympathetic.
d) Post ganglionic fibres from the superior mesenteric ganglion supply the urinary bladder.

x) All are true regarding broncho pulmonary segment except:
a) It forms an independent respiratory unit.
b) Branches of pulmonary artery are segmental in distribution.
c) Pulmonary veins are intersegmental.
d) Segments are wedge shaped with the base directed towards the root of the lung.

001/24

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation), November - December 2024

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

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

1. a) A child presented with pain and watery discharge from right ear following sore throat.
   i) What is the route of spread of infection from throat to ear?
   ii) Describe the anterior wall of middle ear cavity with a labelled diagram.
   iii) What is tympanic plexus?
   iv) Describe the lateral wall structures of middle ear with its clinical importance. 1+6+2+6

   b) A young boy presents to the ENT OPD with history of swallowing of fish bone while eating, followed by pain in the tonsillar region and persistent earache.
   i) Explain the above situation.
   ii) Describe the nerve involved under the following headings: deep nuclear origin, intracranial course, exit from skull, extracranial course, parasympathetic ganglia in relation to it.
   iii) Describe the pathway of taste sensation till the gustatory area in the cortex. 3+(2+1+1+3+2)+3

2. a) What are the specialties of the fourth cranial nerve? Draw a flow chart to show the pathway of the nerve. What is Horner's syndrome? 3+5+2

   b) Enumerate the ventricles of the brain. Describe the circulation of the CSF. Mention the components of the blood brain barrier. Write a note on blood CSF barrier. 1+4+2+3

   c) Enumerate the ligaments of Temporo-mandibular joint. Discuss the mechanism of depression movement. 5+5

3. Write short notes on the following: 2x5
   a) Structure of retina with diagram.
   b) Mosaicism and chimerism.

4. Explain the following statements: 5x4
   a) A gradually increasing lateral cystic swelling in the neck not present at birth.
   b) Patient with pituitary tumor suffers from bitemporal hemianopia.
   c) Injury to the superior gluteal nerve shows the positive trendelenberg's sign.
   d) Calcarine sulcus represents limiting, axial as well as complete sulcus.
   e) Pricking of a furuncle on face leads to cavernous sinus thrombosis and medial squint of eye.

5. Choose the correct option for each of the following: 10x1
   i) Regarding spinal cord, which one of the following statements is not correct?
   a) Spinal cord is a continuation of brain and begins from the upper border of 1st cervical vertebra.
   b) In a child aged less than 2 year, the cord ends at the level of lower border of 3rd lumbar vertebra.
   c) Lateral horn cells are characteristically present in the cervical and lumbar segments of the spinal cord.

d) Arterial supply of the spinal cord are from anterior spinal; posterior spinal; and from supplementary radicular arteries entering the cord.

ii) Regarding posterior inferior cerebellar artery mark the wrong statement:
a) It is usually a branch of vertebral artery.
b) It is commonly a branch of basilar artery.
c) It is typically a highly tortuous artery supplying the cerebellum and allied structures.
d) It takes part in formation of choroid plexus of the 4^{th} ventricle.

iii) Superior laryngeal artery and internal laryngeal nerve pass:
a) Between superior and middle constrictor muscles of pharynx.
b) Between middle and inferior constrictor muscles of pharynx.
c) Between inferior constrictor muscles of pharynx.
d) Between superior constrictor muscles of pharynx and base of the skull.

iv) The lining epithelium of vocal fold is:
a) Simple squamous.
b) Pseudo-stratified ciliated columnar.
c) Stratified squamous non-keratinised.
d) Simple cuboidal.

v) Tip of the nose is supplied by:
a) Infraorbital nerve.
b) Infratrochlear nerve.
c) Zygomatico facial nerve.
d) External nasal nerve.

vi) Root value of inferior gluteal nerve:
a) Dorsal branches of ventral rami of L5,S1,S2.
b) Ventral branches of ventral rami of L5,S1,S2.
c) Dorsal branches of ventral rami of L4,L5,S1.
d) Ventral branches of ventral rami of L4,L5,S1.

vii) Major transmembrane protein in Zonula Adherens is:
a) Claudins.
b) Integrins.
c) E-cadherins.
d) Selectins.

viii) Second pharyngeal pouch gives rise to:
a) Stapedius.
b) Palatine tonsil.
c) Auditory tube.
d) Thymus.

ix) Inversion of the foot is performed by which pair of muscles?
a) Peroneus longus and peroneus brevis.
b) Peroneus longus and tibialis posterior.
c) Tibialis anterior and tibialis posterior.
d) Peroneus brevis and plantaris.

x) Damage to pre-ganglionic parasympathetic fibres to tympanic plexus will result in:
a) Diminished mucus in nasal cavity.
b) Diminished mucus in soft palate.
c) Diminished saliva production by parotid gland.
d) Diminished salivation from sublingual gland.

001/24

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation), November - December 2024

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

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

1. a) A mountaineer on rapid ascent to the peak of a hill 13000 ft height, experienced irritability, headache, breathlessness, nausea, vomiting and sleeplessness. What is the cause of these symptoms? Give reasons. What is acclimatization to high altitude? Discuss the compensatory changes of acclimatization. Enumerate the causes of hypoxic hypoxia. 1+4+2+6+2

   b) A neonate presents with inability to pass stool few days after birth. He had passed meconium on the day of delivery. His abdomen is bloated and the child is in distress. He is diagnosed to be suffering from Hirschsprung's disease. What is the pathophysiology of the disease? Describe the different types of movements of the large intestine. What are the factors influencing gastric emptying? What is blind loop syndrome? 3+6+3+3

2. a) Describe the steps involved in synthesis of Hemoglobin. How does HbS in sickle cell anemia differ structurally from normal Hb? Apart from problems arising out of anemia, what are the other complications of sickle cell anemia? 5+2+3

   b) What is surfactant? Explain how surfactant stabilizes alveoli? What is interdependence? 2+6+2

   c) Describe the mechanism of CO2 transport in the body. What is Haldane effect? What causes the increase of Hematocrit of venous blood? 4+3+3

3. Write short notes on the following: 2x5
   a) Phagocytosis.
   b) Modes of expression of empathy during patient encounters.

4. Explain the following statements: 5x4
   a) Normal saline is effective in hypovolemia.
   b) Negativity is only along the cell membrane.
   c) Low dose aspirin promotes vasodilatation.
   d) Lactobacillus is used in treatment of diarrhea.
   e) Hemolytic jaundice is common in newborn.

5. Choose the correct option for each of the following: 10x1
   i) Osmotic pressure in plasma depends mostly on:
   a) Plasma proteins. b) Na^+
   c) Glucose. d) BUN.

   ii) Spontaneous generation of respiratory rhythm involves:
   a) Acetylcholine. b) Substance P.
   c) Dopamine. d) ATP.

iii) Left ventricular end diastolic pressure increases due to:

a) Increased right atrial pressure.
b) Increased ventricular compliance.
c) Prolonged breath holding.
d) Decreased ventricular tension.

iv) All of the following are related to electrical activity of intestinal smooth muscle except:

a) Slow waves.
b) Generator potential.
c) Spike potential.
d) Basal electric rhythm.

v) Eosinopenia is seen in:

a) Bronchial asthma.
b) Cushing's syndrome.
c) Worm infestation.
d) Urticaria.

vi) Value of which of the following is considered as unit of excitability?

a) Rheobase.
b) Chronaxie.
c) Utilization time.
d) Refractory period.

vii) Which of the following has the highest diffusion coefficient?

a) Oxygen.
b) Carbon dioxide.
c) Carbon monoxide.
d) Helium.

viii) After an accident, a man has to undergo removal of part of his intestines, mainly the ileal region. Which of the following conditions is most likely to develop after the surgery?

a) Constipation.
b) Macrocytic anemia.
c) Dumping syndrome.
d) Hypocalcemic tetany.

ix) Which of the plasma proteins is not synthesized primarily is the liver?

a) Angiotensinogen.
b) C- reactive protein.
c) Angiotensin-II converting enzyme.
d) Fibrinogen.

x) In a maximal expiration, the total volume expired is:

a) Tidal volume.
b) Vital capacity.
c) Expiratory reserve volume.
d) Total lung capacity.

001/24

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation), November - December 2024

Subject: Physiology
Paper: II

Full Marks: 100
Time: 3 hours

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

1. a)A 8 year old boy complains of weakness and repeated episodes of chest infections. He also has polyuria, polydipsia and polyphagia. Urine dipstick test shows glycosuria. Blood tests reveal hyperglycemia and hypertriglyceridemia. The child is suffering from juvenile diabetes mellitus. 4+2+6+3

i. Name the 4 types of cells of endocrine pancreas and what are their functions?
ii. What are the types of diabetes mellitus?
iii. What are the metabolic functions of insulin?
iv. How would you teat a patient of juvenile diabetes mellitus?

b) A 36 years old woman presents to her gynecologist with complaints of amenorrhea and hirsutism. She has also noticed and increase in her weight (especially in the trunk region) and easy fatiguability. She denies any medical problems. Her periods were always normal until 6 months ago and her hirsutism has been gradual in onset. On examination, she has a round hirsute face with central obesity. Her blood pressure is elevated as is her weight compared with previous visits. On abdominal examination, she is noted to have striae.

i) What is the most likely diagnosis?
ii) What will be the biochemical picture to confirm the diagnosis?
iii) Briefly explain the physiological basis of the symptoms mentioned above.
iv) What is the permissive action of this hormone?
v) Enumerate the feature of Addison's disease. 1+2+7+2+3

2. a) What is GFR? How is GFR measured? Describe the mechanism of auto regulation of GFR. 2+3+5

b) Define phototransduction. What do you mean by 'dark current'? Explain in details the mechanism of phototransduction with a suitable diagram. 1+3+6

c) Define puberty. What is precocious puberty? What are the hormonal changes occurring in puberty? What are the theories regarding the onset of puberty? 1+2+4+3

3. Write short notes on the following: 2x5
a) Endocochlear potential.
b) Sertoli cell.

4. Explain the following statements: 5x4
a) People with severe conductive deafness can follow very loud conversations.
b) Cryptorchidism may lead to infertility.
c) Kidney can be considered as an endocrine organ.
d) Stretch reflex maintains resting muscle strength.
e) Myelinated nerve has high conduction velocity.

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

i) All of the following are true for ADH, except:
a) Increase in secretion occurs post operatively.
b) A high protein diet increase the ability of the kidneys to concentrate the urine.
c) Secretion increased when plasma osmolality is low.
d) It acts on collecting duct.

ii) Which of the following EEG waves is found during REM sleep:
a) Delta waves.
b) Alpha waves.
c) Beta waves.
d) Sleep spindles.

iii) 'Iodide trapping mechanism' in thyroid involves:
a) Active transport.
b) Secondary active transport.
c) Facilitated diffusion.
d) Simple diffusion.

iv) Which of the following synaptic transmitters is not a peptide polypeptide or protein?
a) Substance P.
b) Metencephalin.
c) Serotonin.
d) Dynorphin.

v) Hypocalcaemia does not produce:
a) Spasm of skeletal muscle.
b) Laryngospasm.
c) Increase in phosphate excretion in urine.
d) Defective clotting.

vi) Nightmares are found in:
a) REM sleep.
b) NREM stage 1.
c) NREM stage 2.
d) NREM stage 3.

vii) Sperms become motile in:
a) Prostate.
b) Seminal Vesicle.
c) Epididymis.
d) Vas deferens.

viii) Before the onset of puberty the GnRH are under the inhibitory control of:
a) Glycine.
b) Glutamate.
c) GABA.
d) Beta-endorphin

ix) Which of the following is main center of motivation?
a) Nucleus accumbens.
b) Amygdala.
c) Hippocampus.
d) Septum.

x) In UMN type of seventh nerve palsy in the side of hemipegia the lesion is at:
a) Mid Pons.
b) Above pons.
c) Below pons.
d) Midbrain.

001/24

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation),
November - December 2024

Subject: Biochemistry
Paper: I

Full Marks: 100
Time: 3 hours

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

1. a) A 3 year old boy comes to your primary health centre with difficulty in speech. Poor mother complains about delayed developed milestones and dark urine on standing. 3+4+4+4
   i. What would be your provisional diagnosis?
   ii. What tests would you perform in your attached laboratory to confirm your diagnosis?
   iii. What would your advice to poor mother regarding child's diet and why early diagnosis of the child is vital?
   iv. What is the metabolic defect and mention the alternate products formed due to this defect.

   b) Describe the effects of insulin on carbohydrate and lipid metabolism. Explain how uncontrolled Diabetes mellitus may result in Diabetic Ketoacidosis. 7+8

2. a) A child presenting with following features: self mutilation, mental retardation, behaving aggressively towards others. On investigation hyperuricemia was detected. 1+2+4+3
   i) Mention the probable diagnosis.
   ii) How the disease is inherited mention the expected enzyme deficiency.
   iii) Discuss the biochemical basis of the disorder.
   iv) Briefly state the line of management of the condition.

   b) Enumerate the various sources of acetyl Co-A. Discuss in details with diagram about the various fates of Acetyl Co-A. 5+5

   c) Classify with examples supersecondary structures of protein. Name the enzymes and chemical bonds involved in protein folding and briefly their role in it. Name one disease that occurs due to protein misfolding. 3+6+1

3. Write short notes on the following: 2x5
   a) Roles of Indian Medical Graduate.
   b) Role of clearance test in assessment of kidney function.

4. Explain the following statements: 5x4
   a) G6PD deficiency causes hemolytic anemia.
   b) Sucrose is termed as invert sugar.
   c) Hepatic failure may lead to coma.
   d) Ethanol is used in methanol poisoning.
   e) Lecithin is amphipathic as well as amphoteric in nature.

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

i) Which one is the marker enzyme of cytoplasm:
a) Galactosyl transferase. b) Lactate dehydrogenase.
c) Glycogen synthase. d) Pyruvate carboxylase.

ii) The protein clathrin is associated with one of the following receptors.
a) Hepatic lipase. b) Scavenger receptor.
c) LDL recptor. d) Remnant receptor.

iii) Which enzyme does NOT have copper as coenzyme?
a) Cytochrome oxidase. b) Xanthine oxidase.
c) Superoxide dismutase. d) Tyrosinase.

iv) Erythrocyte glucose transporter is an example of:
a) Ion driven active transport. b) Facilitated diffusion.
c) Active transport. d) Simple diffusion.

v) Which of the following is zinc dependent?
a) Carbonic anhydrase. b) Hexokinase.
c) Pyruvate kinase. d) Aldolase.

vi) Allopurinol inhibits:
a) Xanthine oxidase. b) Super oxide dismutase.
c) Amylase. d) Lipase.

vii) Which of the following amino acids has the highest buffering potentiality?
a) Alanine. b) Histidine.
c) Arginine. d) Methionine.

viii) Allosteric activator of PFK-1is:
a) Fructose 2-6 biphosphate. b) Citrate.
c) N-Acetyl glutamate. d) Malonyl CoA.

ix) Which parameter rises in bone tumor?
a) ALT b) Alkaline phosphatase.
c) AST d) Gamma glutamyl transferase.

x) Formminoglutamate (FIGLU) is formed in the metabolism of:
a) Tryptophan b) Arginine c) Glutamate d) Histidine

001/24

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation),
November - December 2024

Subject: Biochemistry **Full Marks: 100**

Paper: II **Time: 3 hours**

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

1. a) A 50 years old female patient was admitted to the hospital with symptoms of Diphtheria, a disease caused by Corynebacterium diphtheriae. The Diphtheria toxin inhibits translation in mammalian systems. 6+3+6
i) Describe the process of translation in eukaryotes with flow diagram.
ii) Name three inhibitors of protein synthesis and mention their mechanism of action.
iii) Enumerate post translational modifications.

b) Enumerate any three different antigen presenting cells (APC). State one important specific function of each. Write a brief note about the role of Reactive Oxygen Species (ROS) on destruction of pathogen. What are the different types of vaccines used? Give one example of each. 3+3+5+2+2

2. a) List the name of four hormones acting through G-protein coupled receptor. Describe the process of signal transduction by any one of those hormones. Give examples of enzymes which are activated and inhibited by that hormone. 2+6+2

b) Write the interrelationship of Vitamin B12 and Folic acid in biochemical process. State the role of Vitamin B12 in metabolism of odd chain Fatty acid. Briefly describe FIGLU. 4+4+2

c) A 6 month old baby was brought to the hospital with a history of fall and swollen leg. Mother gave history of the child sustaining multiple fractures of various bones from 1 month to now. X ray revealed few trabeculae and thin cortices. 2+3+5
i) What is the most probable diagnosis?
ii) What is the biochemical basis of the disease?
iii) Enumerate the types, structures, synthesis and function of collagen.

3. Write short notes on the following: 2x5
a) Osteogenesis imperfecta.
b) Anti-oxidant vitamins and their interdependency.

4. Explain the following statements: 5x4
a) NADPH plays an important role in some phase I xenobiotic reactions.
b) Restriction fragment length polymorphism (RFLP) can be a very effective tool in forensic sciences.
c) Antibiotics do not inhibit eukaryotic translation.
d) Zinc supplementation is given to boost immunity.
e) Coumarin group of drugs act as anti-coagulant.

10x1

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

i) Pattern of inheritance of MHC genes is:
a) Autosomal dominant.
b) Autosomal recessive.
c) Sex linked recessive.
d) Codominant.

ii) Which of the following hormones use tyrosine kinase as second messenger?
a) Insulin and growth hormone.
b) TSH and growth hormone.
c) Insulin and TSH.
d) TSH and Catecholamine.

iii) The true value of urea of a control is 40. You perform urea estimation 5 times from same control material by same method and same instrument. Values are 40, 42, 39, 40 and 41. It indicates:
a) Precision.
b) Accuracy.
c) Precision and accuracy both.
d) None.

iv) Insulin activates:
a) Glycogen synthase.
b) Glycogen phosphorylase.
c) Branching enzyme.
d) Debranching enzyme.

v) Western blot transfer technique is utilized for visualization of:
a) DNA.
b) RNA.
c) Protein.
d) Glycoprotein.

vi) Normal role m-RNA is:
a) RNA splicing.
b) Transcription.
c) Gene regulation.
d) RNA editing.

vii) UGA can code for:
a) Tryptophan and Pyrrolysine.
b) Selenocysteine and Methionine.
c) Selenocysteine and Tryptophan.
d) Pyrrolysine and Selenocysteine.

viii) Choose the vitamin involved in post translational modification:
a) Vitamin C.
b) Vitamin A.
c) Folic acid.
d) Pyridoxine.

ix) Identify the transporter which is defective in renal glycosuria:
a) GLUT 1
b) SGLT 1.
c) GLUT 2
d) SGLT 2.

x) PCR technique requires all except:
a) Primers
b) Primase
c) A template DNA
d) Deoxy ribonucleoside triphosphates.