2406000101010502
EXAMINATION AUGUST 2024
FIRST MBBS
ANATOMY (PAPER - II) (NEW) - LEVEL 1

[Time: As Per Schedule] **[Max. Marks:100]**

Instructions:

1. **Fill up strictly the following details on your answer book**
   a) Name of the Examination: **FIRST MBBS**
   b) Name of the Subject: **ANATOMY (PAPER - II) (NEW) – LEVEL 1**
   c) Subject Code No :**2406000101010502**
2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.
5. Write each section in separate answer sheet.
6. Write to the point.

Seat No:

Student's Signature

SECTION -A

Q.1 MCQs **20**

1. Appendices epiploicae is cardinal feature of:
   [a] Appendix [b] Caecum
   [c] Rectum [d] Sigmoid colon

2. The structure found in a cross section of the thorax at the level of T4 vertebra is:
   [a] Azygos vein [b] Arch of aorta
   [c] Brachio-cephalic artery [d] Left subclavian artery

3. Brunner's glands are seen in the microscopic anatomy of:
   [a] Colon [b] Ileum
   [c] Duodenum [d] Stomach

4. Which bursa is inflamed in the "Clergymen's knee"?
   [a] Pre-patellar bursa [b] Superficial Infra-patellar bursa
   [c] Supra-patellar bursa [d] None of the above

5. Adrenal medulla develops from:
   [a] Intermediate Mesoderm
   [b] Endoderm
   [c] Neural crest cell
   [d] Para-axial mesoderm

6. Nerve which accompany great saphenous vein is:
   [a] Sural nerve
   [b] Saphenous nerve
   [c] Femoral nerve
   [d] Sural communicating nerve

7. Which of the following nerves are regarded as 'typical intercostal nerve'?
   [a] 2,3,4,5
   [b] 5,6,7,8
   [c] 3,4,5,6
   [d] 1,2,3,4

8. Which of the following artery is not a branch of superior mesenteric artery?
   [a] Right colic artery
   [b] Left colic artery
   [c] Ileocolic artery
   [d] Middle colic artery

9. Genotype of Turner's syndrome is:
   [a] 46, XX
   [b] 47, XXY
   [c] 45, XO
   [d] 46, XY

10. All of the following structures pass from lesser sciatic notch except:
   [a] Nerve to quadratus femoris
   [b] Pudendal nerve
   [c] Nerve to obturator internus
   [d] Tendon of obturator internus

11. Type of epithelium seen in mucosa of urinary bladder is:
   [a] Simple columnar epithelium
   [b] Stratified columnar epithelium
   [c] Transitional epithelium
   [d] Stratified squamous keratinized epithelium

12. All of the following ligaments are attached to cervix of the uterus except:
   [a] Utero sacral ligament
   [b] Mackenrodt's ligament
   [c] Round ligament of uterus
   [d] Pubo cervical ligament

13. Papillary muscle is seen in the interior of:
[a] Right atrium & left atrium
[b] Right atrium & right ventricle
[c] Left atrium & left ventricle
[d] Right ventricle & left ventricle

14. Which of the following is the remnant of mesonephric duct in male?
[a] Epoophoron
[b] Appendix of testis
[c] Paroophoroon
[d] Appendix of epididymis

15. Which of the following structures is the content of the Calot's triangle?
[a] Cystic artery
[b] Cystic duct
[c] Common hepatic duct
[d] Inferior border of liver

16. In male karyotype, 'Y' chromosome is which type of chromosome?
[a] Metacentric
[b] Submetacentric
[c] Acrocentric
[d] Telocentric

17. Tarsal bone devoid of muscle attachment is:
[a] Navicular
[b] Talus
[c] Calcaneum
[d] Medial cuneiform

18. Upper six anterior intercostal arteries are branches of:
[a] Descending thoracic aorta
[b] Superior intercostal artery
[c] Arch of aorta
[d] Internal thoracic artery

19. Following is muscle of deep perineal space:
[a] Ischiocavernous
[b] Bulbospongiosus
[c] Sphincter urethrae
[d] Superficial transverse perinei

20. Which of the following muscle is not the muscle of 1st layer of the sole?
[a] Flexor digitorum longus
[b] Abductor hallucis
[c] Flexor digitorum brevis
[d] Abductor digitiminimi

SECTION-B

Q.2 Case base question (two out of three) **16**

1. A male child was delivered by caesarean section in the maternity ward. The pediatric doctor was examining the newborn. During physical examination, he found the right side of the scrotum empty. While palpating surrounding area, he found small swelling in the inguinal region on the same side. **1+3+2+2**
   a) Name the clinical condition.
   b) What is the normal schedule of testicular descent?
   c) Write the factors responsible for descent of testis.
   d) Enlist the other any two congenital anomalies of the testis.

2. A 30-year-old man presented with a steppage gait and an inability to move the left ankle joint freely. He had a recent history of injury to the lateral side of the upper part of the left leg. On physical examination doctor noticed loss of dorsiflexion and eversion on the affected side. The foot was kept in plantar-flexion position. He also found loss of sensation on the lateral aspect of the lower part of the leg and dorsum of the foot. **1+2+2+3**
   a) Name the clinical condition.
   b) Write name and root value of affected nerve.
   c) Enlist the muscled supplied by affected nerve.
   d) Draw a labeled diagram showing course, relation and branches of affected nerve.

3. A 70 years old man, chain smoker, visited the general physician with complaints of extreme tiredness, weight loss and persistent cough and sometimes blood stained sputum. On clinical examination, the doctor found partial ptosis, constriction of pupil in right side and multiple dilated veins around the neck. The X-ray chest showed a radiopaque shadow in the apical region of the right lung. Biopsy revealed malignancy. **2+1+3+2**
   a) Why bronchogenic carcinoma is common on right side?
   b) Define broncho-pulmonary segment.
   c) Draw a labeled diagram of broncho-pulmonary segment of lung.
   d) What is Horner's syndrome? And anatomical basis of it.

Q.3 **a) Write short note (two out of three)** **10**

1. Guy ropes

2. Hip joint: ligaments (enumerate only), movement and applied anatomy

3. Popliteal fossa in detail

b) Write short note on **10**

1. Histology of spleen

OR

Histology of muscular artery

2. Histology of epididymis

OR

Histology of fundus part of stomach

c) Write short note (one out of two) **4**

1. Turner's syndrome

2. Autosomal dominant inheritance

SECTION-C

Q.4 **Long question (two out of three)** **16**

1. Porto-caval anastomosis with proper labeled diagram

2. Coverings of kidney with applied anatomy of kidney

3. Blood supply and lymphatic drainage of stomach with applied anatomy of stomach

Q.5 **a) Write short note (two out of three)** **10**

1. Internal thoracic artery: origin, course, relations, branches and clinical anatomy

2. Pericardium and pericardial sinuses

3. Interior of right atrium

b) Write short note on (two out of three) **10**

1. Development of portal vein

2. Tetralogy of Fallot

3. Development of interatrial septum with congenital anomalies

c) Write short note (one out of two) **4**

Describe importance of dissection in anatomy

OR

Barium studies

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2406000101010501
EXAMINATION AUGUST 2024
FIRST MBBS
ANATOMY (PAPER - I) (NEW) - LEVEL 1

[Time: As Per Schedule] **[Max. Marks:100]**

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   c) Subject Code No :**2406000101010501**
2. Sketch neat and labelled diagram wherever necessary.
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Seat No:

Student's Signature

SECTION - A

Q.1 MCQs **20**

1. The _____ is common direction of the shoulder joint dislocation
   a. Superior b. Inferior c. Medial d. Lateral

2. The anterior interosseous nerve is a branch of _____
   a. Superficial branch of radial nerve
   b. Median nerve
   c. Ulnar nerve
   d. Deep branch of radial nerve

3. Which of the following structure is passing superficial to flexor retinaculum?
   a. Median nerve
   b. Ulnar nerve
   c. Tendon of flexor digitorum superficialis
   d. Tendon of flexor pollicis longus

4. All are developed from ectoderm EXCEPT:
   a. Lens
   b. Brain
   c. Spinal cord
   d. Ciliary muscle

5. Nucleus ambiguous is found in:
   a. Pons
   b. Medulla oblongata
   c. Mid brain
   d. Spinal cord

6. Tongue muscle develop from _____
   a. Ectoderm of pharyngeal pouch
   b. Cervical somites
   c. Occipital myotome
   d. Endoderm of pharyngeal pouch

7. Afferent of lateral geniculate body is _____
   a. Optic tract
   b. Auditory radiation
   c. Superior cerebellar peduncle
   d. Corpus callosum

8. The paracentral lobule is located on:
   a. Medial surface of the cerebral hemisphere
   b. Tentorial surface of the cerebral hemisphere
   c. Orbital surface of the cerebral hemisphere
   d. Superolateral surface of the cerebral hemisphere

9. The Passavant's ridge is formed by _____ muscle
   a. Salpingopharyngeus
   b. Stylopharyngeus
   c. Palatopharyngeus
   d. Thyropharyngeus

10. For safety reason ideal site for lumbar puncture in adult would be between _____ vertebra
   a. L1 and L2
   b. L3 and L4
   c. L5 and S1
   d. T12 and L1

11. Parotid duct opens _____
   a. Opposite upper 1st molar
   b. Opposite upper 2nd molar
   c. Into the papilla
   d. Opposite lower 2nd molar

12. Non keratinized stratified squamous epithelium is present in:
   a. Gall bladder
   b. Duodenum
   c. Trachea
   d. Oesophagus

13. All the following carpo-metacarpal joints are of plane variety of synovial joint EXCEPT:
    a. 1st carpo-metacarpal joint
    b. 2nd carpo-metacarpal joint
    c. 3rd carpometacarpal joint
    d. 4th carpo-metacarpal joint

14. The dermatome of little finger is _____
    a. T4 b. C4 c. C6 d. C8

15. Which of the following is an example of atavistic epiphysis?
    a. Coracoid process of scapula
    b. Greater trochanter of femur
    c. Coronoid process of ulna
    d. Osvesalianum

16. All of the following are examples of bipennate muscle EXCEPT:
    a. Extensor digitorum longus
    b. Rectus femoris
    c. Rectus abdominis
    d. 3rd dorsal interossei of hand

17. Mucous secreting glands are absent in:
    a. Cervix b. Vagina c. Duodenum d. Oesophagus

18. Red and white pulp are histological characteristics of:
    a. Spleen
    b. Thymus
    c. Palatine Tonsil
    d. Lymph node

19. Upper motor neuron type of paralysis is characterized by all, EXCEPT:
    a. Hypotonia
    b. Babinski's sign positive
    c. Deep reflex exaggerated
    d. Clasp knife rigidity

20. In thyroidectomy surgery, superior thyroid artery should be ligated _____
    a. Near upper pole of the lateral lobe
    b. Near lower pole of the gland
    c. Near its origin from external carotid artery
    d. Anywhere in its course

SECTION - B

Q.2 Case base question (two out of three) **16**

1. A 24-year-old student had road traffic accident and suffered injury to upper part of his left forehead. He was shifted to emergency department of nearest hospital. The doctor noticed a lacerated wound which was bleeding profusely. The doctor applied pressure over the wound for few minutes followed by stitching the wound. The student developed black colour around eye after 2 days so he visited doctor again. **2+2+2+2**
    a. Why was the wound bleeding profusely?
    b. What is the reason behind applying pressure over the wound?
    c. Why the student developed black eye after 2 days.
    d. Which is dangerous layer of the scalp and why?

2. A 35-year-old female visited a tertiary care hospital as routine follow up visit after breast cancer surgery. Her daughter informed the doctor that her mother is having bony swelling on the left side of the back. On physical examination, the doctor found a prominent medial border of the left scapula, including its inferior part. On asking her to push the wall against resistance, the swelling became more prominent. **2+2+2+2**
    a. Identify the condition and affected nerve.
    b. Name the muscle supplied by affected nerve. Name the movements produced by affected muscle.
    c. Explain the anatomical basis of the above condition.
    d. Write the boundaries of triangle of auscultation.

3. A 63 years old man visited the doctor along with his wife. His wife told the doctor that he walks by forward bending, slowing of movements, difficulty in eating food and stray eyes with loss of emotional expression. Physical examination revealed hand tremors, generalized slowing of movements and rigidity. The doctor diagnosed the condition as a case of paralytic agitans. **2+2+2+2**
    a. What is other name of this condition and cause of this condition?
    b. Which type of tremors are produced in this condition?
    c. Which type of rigidity is produced in this condition?
    d. What is difference in this condition and cerebellar lesion?

Q.3 **a) Write short note (two out of three)** **10**

1. Anastomosis around scapula and elbow joint
2. Draw a labeled diagram of brachial plexus. Write about Erb's point and related clinical anatomy
3. Palmar spaces of hand

b) Write short note on **10**

1. Implantation

   OR

   Somites

2. Derivatives of first pharyngeal arch

   OR

   Development of palate

c) Write short note (one out of two) **4**

1. Synovial joint: general features and classification
2. End artery

SECTION - C

Q.4 **Long question (two out of three)** **16**

1. Describe posterior triangle of the neck in detail with necessary diagram
2. Temporomandibular joint: type, ligaments, relation, movements and applied
3. Draw labeled diagram of interior of larynx. Describe movements of rima glottides and muscles producing movements.

Q.5 **a) Write short note (two out of three)** **10**

1. Internal capsule in detail
2. Functional areas of frontal lobe with relevant applied anatomy
3. Transverse section of medulla oblongata at the level of pyramidaldecussation

b) Write short note on **10**

1. Histology of compact bone

OR

Classification of glands

2. Histology of cerebellum

OR

Histology of pituitary gland

c) Write short note (one out of two) **4**

1. Blood supply of long bone
2. Transitional epithelium

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2406000101030701
EXAMINATION AUGUST 2024
FIRST MBBS
BIO-CHEMISTRY (PAPER - I) (NEW) - LEVEL 3

[Time: As Per Schedule] **[Max. Marks:100]**

Instructions:
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   b. Name of the Subject: **BIO-CHEMISTRY (PAPER - I) (NEW) - LEVEL 3**
   c. Subject Code No: **2406000101030701**
2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.

Seat No:

Student's Signature

Section A

Q.1 Multiple choice questions (20 out of 20) **20x1=20**

1) A known diabetic patient went for the consultation, his clinician asked him to go for the analysis of HbA1c. He visited clinical laboratory with requisition slip. The duty technician collected blood sample into a vacutainer. What was that vacutainer.
   a) sodium fluoride containing
   b) sodium oxalate containing
   c) Both sodium fluoride and oxalate containing
   d) EDTA containing

2) A 35-year male was brought to emergency in an unconscious state. He was a habitual drinker. When his blood sample was analyzed, blood glucose levels were found to be low (48mg/dl). Blood glucose levels were low due to:
   a) Increase in the catabolism of blood glucose
   b) Increased availability of NAD+
   c) Decreased availability of pyruvate and oxaloacetate
   d) Increased availability of NADPH

3) A 40-year-old chronic alcoholic enters the hospital because of a variety of symptoms, including loss of feeling in his hands and feet, nystagmus, and difficulty with his balance when walking. This patient would have difficulty catalyzing which one of the following reactions?

a) α-Ketoglutarate dehydrogenase
b) Pyruvate carboxylase
c) Succinate dehydrogenase
d) Fumarase

4) Which one of the following statements concerning dietary lipid is correct?

a) Corn oil and soybean oil are examples of fats rich in saturated fatty acids.
b) Triacylglycerols obtained from plants generally contain less unsaturated fatty acids than those from animals.
c) Fatty acids containing double bonds in the trans configuration, unlike the naturally occurring cis isomers, raise plasma cholesterol levels.
d) Coconut and palm oils are rich in polyunsaturated fats.

5) A 32-year-old poorly controlled diabetic pregnant lady is undergoing amniocentesis at 36 weeks for fetal lung maturity prior to having a cesarean delivery. Which of the following laboratory tests results on the amniotic fluid would best indicate that the fetal lungs are mature?

a) Phosphatidylglycerol is present
b) Lecithin/sphingomyelin (L/S) ratio of 1:1
c) Cephalin is present
d) Phosphatidylinositol is present

6) A final MBBS student represented marathon events in the interuniversity sports event. Prior to participation he prepared himself with shifting of his diet to carbohydrates with high starch content. What will be products which are sequentially formed by the action of pancreatic amylase.

a) Amylose, amylopectin, and maltose
b) Limit dextrin, maltotriose and maltose
c) Maltotriose, maltose and glucose
d) Amylose, maltotriose and maltose

7) Defective enzyme in Hereditary fructose intolerance is

a) Fructokinase
b) Aldolase B
c) Phosphofructokinase
d) Fructose 1,6 bisphosphatase

8) Which one of the reactions listed replenishes a TCA cycle intermediate?

a) Heme Synthesis
b) Carboxylation of pyruvate
c) Transamination of oxaloacetate
d) carboxylation of acetyl CoA

9) 52-year-old man suddenly collapsed at work. He was diagnosed with acute myocardial infarction. Tissue plasminogen activator was administered to the patient, but further damage to the affected organ resulted from this treatment. This may have happened owing to which one of the following?

a) Elevated lactic acid levels
b) Increased generation of oxygen-derived radicals
c) Release of cytochrome a from the mitochondria
d) Inhibition of the TCA cycle due to plasminogen activator administration

10) A woman develops severe abdominal cramps and flatulence whenever she eats dairy products, so she has decided to eliminate all such products from her diet. Which one of the following is an accurate statement concerning sugar metabolism in this woman?

a) She cannot produce mucopolysaccharides that contain galactose.
b) She cannot produce lactose during lactation.
c) She can eat curd in the dairy products.
d) She is likely to have high levels of galactose-1-phosphate.

11) A person with Type 1 diabetes went on a trip and ran out of insulin. after 4 days she felt lethargic, nauseous, and had difficulty standing. After appropriate treatment, which one of the following liver enzymes would be reduced in activity as compared to before treatment?

a) Phosphofructokinase-2
b) Pyruvate dehydrogenase
c) Pyruvate kinase
d) Fructose 1,6-bisphosphatase

12) A man presents to the emergency room with an elevated temperature, sweats, and increased rate of breathing. He had been spraying insecticide and accidentally inhaled some of the poison. Using the insecticide on cultured cells, it was demonstrated that the rate of

oxygen consumption by the cells was much greater than in the absence of the compound. Identify the most likely causative agent from below:

a) Carbon monoxide.
b) Dintrophenol
c) Rotenone
d) Cyanide

13) A 4-year-old boy has had a history of skin infections, pneumonia, nausea, vomiting, and abdominal pain. He has been on antibiotics prophylactically for the past year, but still contracts various sort of infections, both bacterial and fungal. The boy most likely has inherited a mutation that prevents which one of the following reactions?

a) Oxidized glutathione to reduced glutathione
b) The formation of superoxide
c) Hydrogen peroxide conversion to hydroxyl radicals
d) Superoxide conversion to hydrogen peroxide and oxygen

14) A 50-years old female obese was recently diagnosed with coronary artery disease was advised to increase green leafy vegetables intake in her diet. All of the following are the beneficial effects of that diet, EXCEPT

a) Dietary fibers increase glycemic index.
b) Dietary fibers decrease absorption of bile acids and increase production of bile acids.
c) Sitosterol present in the diet decreases cholesterol absorption
d) Dietary fibers retain water in feces and increase stomach fullness.

15) A medical student has been studying for exams, and neglects to eat anything for 12 hours. At this point, the student opens a large packet of potato chips and eats every one of them in a short period. Which one of the following is elevated in his plasma?

a) Chylomicrons
b) Glucagon
c) Acetolactate
d) Free fatty acids

16) A lab technician has collected the blood sample of a patient in a plain vacuum cleaner for glucose estimation. The sample was analyzed four hours after sample collection. The lab in charge observed that the value of serum glucose was lower than the actual value. So he advised the lab technician to collect blood samples in which of the following containing vacutainer for glucose estimation to have accurate results.

a) Sodium Qxalate
b) Ethylenediamine tetra acetate
c) Sodium fluoride (EDTA)
d) Heparin

17) Leptin is a hormone secreted by adipose tissue which regulates energy intake and expenditure. It regulates appetite by
a) Inhibiting Melanocyte stimulating hormone
b) Inhibiting Neuropeptide Y
c) Increasing secretion of Insulin
d) Increasing secretion of orexin

18) A baby boy 10-month-old comes with vomiting severe jaundice, hepatomegaly and features of irritability on starting weaning with fruit juice. Which of the following enzymes is defective?
a) Fructokinase
b) Aldolase B
c) Galactose 1 Phosphate Uridyl transferase
d) Medium chain fatty acyl CoA dehydrogenase

19) Hemolyzed sample is not suitable for estimation of which parameter?
a) Potassium
b) Calcium
c) Chloride
d) Sodium

20) A diabetic patient develops paresthesia and loss of sensations in lower limbs. This has resulted from which one of the following?
a) Reduced glucose levels in the blood
b) Elevated glucagon levels
c) Elevated LDL levels in the blood
d) Increased sorbitol levels in Schwann cells

Section B

Q.2 Long Answer Questions (2 out of 3) **2x10=20**

1) Describe the metabolism of alcohol. **3**
Describe and explain biochemical alterations that occur during alcoholism. **3**
Describe the effects of chronic alcoholism on the liver, central nervous system, and heart. **3**
Enumerate biochemical markers for monitoring of alcoholism. **1**

2) Describe the electron transport chain and oxidative phosphorylation. **5+3**
What are uncouplers and explain them by giving suitable examples. **2**

3) Describe at least six risk factors for Atherosclerosis. **3**
Describe LDL-cholesterol metabolism. **3**

Describe the causes of primary familial hypercholesterolemia. 2

Explain the basis of using the 'Statin' group of drugs to reduce cholesterol levels. 2

Q.3 Short Answer Questions (10 out of 11) **10x2=20**

1) Explain why excess lipoprotein (a) is atherogenic.
2) Why cataracts and hepatomegaly are seen in galactosemia?
3) Write at least four differences between hexokinase and glucokinase.
4) Explain why fasting hypoglycemia and hyperuricemia are seen in type-1 glycogen storage disease.
5) Draw the Cori's cycle and write its significance.
6) Write types of vesicular transport mechanisms with suitable examples.
7) Why are premature babies prone to acute respiratory distress syndrome?
8) Calcium level in blood is increased by parathyroid hormone. Explain.
9) Iron is conserved in our body. Explain.
10) Write any four phase-II detoxification reactions with suitable examples.
11) Oral iron treatment should be supplemented with ascorbate and tocopherol. Why?

Section C

Q.4 Short Answer Questions (4 out of 5) **4x5=20**

1) Describe protein energy malnutrition.
2) Describe the liver enzyme profile with significance.
3) Describe the synthesis and clinical significance of Prostaglandins **(2+3)**

4) Describe the roles and responsibilities of a physician in the health-care system.

5) Describe the functions of NADPH.

Q.5 Clinical Cases (2 out of 2) **2x10=20**

1) A 32-year-old man from a rural area was admitted to the hospital with chief complaints and clinical features of fatigue, jaundice, and dark urine. His pertinent laboratory findings included normocytic and normochromic anemia, elevated serum unconjugated bilirubin, and decreased hemoglobin levels. When blood was analyzed, there were very low levels of Glucose-6- Phosphate Dehydrogenase (G6PD). The diagnosis of intravascular hemolysis was attributed to G6PD deficiency.

1. In which metabolic pathway G6PD is required, describe the step on which it acts **2**

2. Which coenzyme is required for the action of this enzyme and give two functions of an altered form of coenzyme **2**

3. Why the deficiency of this enzyme leads to hemolysis and jaundice? **2**

4. Which form of bilirubin do you expect to be increased in this deficiency and why it is so? **2**

5. Do the subjects of G6PD are protected against malaria? If so, explain the mechanism. **2**

2) A 55-year-old person was brought to the hospital in a confused and semiconscious state. He had a low BP and a feeble pulse. His breath had a fruity odor. His random blood sugar was 800 mg/dl. Urine sugar was 4+ and urine ketone bodies were 3+. His blood pH was 7.1 (7.35-7.45). Plasma bicarbonate (HCO3) was 12 mmol/l (24-30 mmol/l) and carbonic acid was 1.2 mmol/l (1-2 mmol/l). It was diagnosed as diabetic ketoacidosis.

1) What is diabetic ketoacidosis? The main problems in Diabetic ketoacidosis are hyperglycemia, hyperketonemia, and metabolic acidosis. Explain why these are observed in Diabetic ketoacidosis. **2**

2) What is the rationale behind rapid infusion of normal saline, administration of insulin and potassium, and correction of acidosis? **2**

3) What is metabolic acidosis? Write at least four causes of it. **2**

4) What are compensatory mechanisms and which organs are involved in this mechanism and why it is important **2**

5) Enlist other acid-bases disorders. **2**

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2406000101030702
EXAMINATION AUGUST 2024
FIRST MBBS
BIO-CHEMISTRY (PAPER - II) (NEW) - LEVEL 3

[Time: As Per Schedule] **[Max. Marks: 100]**

Instructions

Seat No

Fill up strictly the following details on your answer book

1. Name of the Examination: **FIRST MBBS**
2. Name of the Subject: **BIO-CHEMISTRY (PAPER - II) (NEW) - LEVEL 3**
3. Subject Code No: **2406000101030702**

Sketch neat and labelled diagram wherever necessary

Figures to the right indicate full marks of the question.

All questions are compulsory.

Student's Signature

SECTION A

Q.1 Multiple choice questions. (20 out of 20) **20*1=20**

A 3 year old male patient was suffering from Wilson's disease. His ceruloplasmin level was low and liver enzymes were elevated. Which of the following minerals is useful in the treatment?

1. Zinc
2. Copper
3. Iron
4. Molybdenum

Enzyme A digests proteins in the stomach (pH environment with a pH of 2). Enzyme B digests proteins in the small intestine (pH environment with a pH of 8). Which of the following is NOT true

1. Enzyme A would denature in the small intestine
2. Enzyme A would have a similar mechanism
3. Enzyme B would denature in the stomach
4. Enzyme B would denature in the small intestine

3. A newborn does well with breast feeding. Two days later, the mother brought the infant to emergency as the baby was bleeding from umbilical cord and nostrils. The most likely cause is:
   a) Deficiency of vitamin C due to a citrus poor diet during pregnancy
   b) Deficiency of vitamin K because disseminated intravascular coagulation
   c) Deficiency of vitamin K because infant intestines are sterile.
   d) Deficiency of vitamin E due to maternal malabsorption during pregnancy.

4. A 42 years old man comes to OPD with complaints of frequent bleeding nose and easy bruisability. For past 1 month. He was treated with prolong antibiotic therapy for chronic diarrhea. Which of the following laboratory finding is most likely?
   a) Elevated fibrinogen level
   b) Elevated Prothrombin time
   c) Elevated Platelet count
   d) Elevated bleeding time

5. A 40 years old male came to OPD with complaints of anorexia, listlessness and numbness of legs. Examination shows loss of sensation on legs and edema was observed. He was suspected of suffering from Beriberi. Which of the following tests will confirm the diagnosis?
   a) FIGLU excretion test
   b) Methylmalonic acid in urine
   c) Kynureninase activity
   d) Erythrocyte transketolase activity

6. A 2 years old boy was brought to OPD with complaints of rash surrounding mouth and nose and diarrhea. What supplementation should be given to the child?
   a) Vitamin C
   b) Zinc
   c) Folic acid
   d) Copper

7. Adenosine deaminase deficiency leads to severe Combined immune deficiency because of accumulated dATP inhibits which of the following enzyme?
   a) Adenosine Phosphoribosyltransferase
   b) Ribonucleotide Reductase
   c) Orotate Phosphoribosyltransferase
   d) CTP Synthetase

8. Which one of the following is the toxin-based vaccine?
   a) Polio
   b) Diphtheria
   c) MMR
   d) Rabies

9. 48-year-old man presents to your office complaining of generalized weakness and increased pain on left side of chest & both thighs. Physical examination reveals muscle strength of 4 out of 5 in all extremities as well as pain on palpation of the fifth and sixth ribs on his left side. The x-ray films reveal several healed rib fractures as well as diffuse radiolucency with thinning of the cortical bone of his femur. Which serum enzyme level will increase in this case?
   a) Acid phosphatase
   b) Alanine amino transferase
   c) Aspartate amino transferase
   d) Alkaline phosphatase

10. 1. A child with short stature, brittle bone and blue sclera is found to have mutation in collagen. Which of the following is the recurring amino acid is the most likely to be altered in mutation that distort collagen molecule?
   a) Glycine
   b) Lysine
   c) Proline
   d) Tryptophan

11. A 45 years old male suffering from diabetes mellites for 8 years. He was presented with erectile dysfunction. He was prescribed Sildenafil Citrate. What is the mechanism of action of this drug?
   a) Activates Guanylate cyclase
   b) Activates Nitric Oxide synthase
   c) Inhibits Phosphodiesterase type 5
   d) Activates Adenyl cyclase

12. A 72 years old man diagnosed with Alzheimer's disease. In this patient Amyloid precursor protein's normal alpha helical structure gets disrupted due to mutation. The following mutational change affects alpha helical structure of mutant protein.

a) Methionine to Proline
b) Valine to Alanine
c) Glutamate to Aspartate
d) Lysine to Arginine

13. A woman has been complaining of a sore throat and cough, and a sputum culture demonstrated a bacterial infection. The physician placed the woman on erythromycin. Erythromycin will be effective in eliminating the bacteria because it interferes with which one of the following processes?

a) DNA replication
b) Elongation of protein synthesis
c) Initiation of protein synthesis
d) RNA synthesis

14. A pathologist, while doing an autopsy of a patient who died from Creutzfeldt-Jakob syndrome, accidentally cut himself while examining the brain. The pathologist became very concerned for his well-being. The precipitating event in the patient's brain that led to this disease is which one of the following?

a) Infection of the brain with a virus
b) Proteolytic cleavage of an existing brain protein
c) An altered secondary and tertiary structures for an existing brain protein
d) Altered gene expression

15. 34-year-old female has a history of intermittent episodes of severe abdominal pain. She has had multiple abdominal surgeries and exploratory procedures with no abnormal findings. Her urine appears dark during an attack and gets even darker if exposed to sunlight. This patient most likely has difficulty in synthesizing which of the following?

a) Heme
b) Methionine
c) Creatine Phosphate
d) Urea

16. A 42 years old man comes to OPD with complaints of frequent bleeding nose and easy bruisability. For past 1 month. He was treated with prolong antibiotic therapy for chronic diarrhea. Which of the following laboratory finding is most likely?

a) Elevated fibrinogen level
b) Elevated bleeding time
c) Elevated Platelet count
d) Elevated Prothrombin time

17. Which one of the following occurs in the urea cycle?

a) Carbamoyl phosphate is derived directly from glutamine and CO2.
b) The a-amino group of arginine forms one of the two nitrogen of urea.
c) N-acetylglutamate is a positive allosteric effector of ornithine transcarbamoylase.
d) Ornithine directly reacts with carbamoyl phosphate to form citrulline.

18. A 40 years old female presented to the emergency center with complaints of nausea, vomiting and abdominal pain. Her pain was located in the mid epigastric area and right upper quadrant. Lab investigation shows high serum lipase levels. What is the probable diagnosis?

a) A cute pancreatitis
b) Viral hepatitis
c) A cute gastritis
d) Gall stone

19. Membrane bound and secretory forms of Immunoglobulin are created due to which of the following process?

a) m RNA editing
b) Alternative mRNA splicing
c) Gene amplification
d) Gene rearrangement

20. Which of the following is NOT True about PCR?

a) Thermostable enzyme Taq Polymerase is.used
b) Annealing comes after denaturation
c) Specific primers are required
d) The extension step is performed at 50°C temperature for 30 seconds.

SECTION B

Q.2 Long Answer Questions (2 out of 3) **2*10=20**

1. Describe the pathway (location, steps, energetics, and regulation) through which ammonia is finally disposed of from our body (1+2+1+2). Write a note on disorders of this pathway (4).

2. Describe gene expression regulation in prokaryotes (6). Write a note on cell cycle and its checkpoints (4).

3. Describe the general structure of immunoglobulin (2). Describe the functions and significance of immunoglobulins (5). Describe principles of vaccine development (3).

Q.3 Short Answer Questions (10 out of 11) **10*2=20**

1. The salvage pathway is more economical than the de-novo synthesis of purine nucleotide. Explain.

2. Edema develops when the albumin level is decreased. Why?

3. Enumerate types of blotting techniques with their significance.

4. Write at least two products formed from glycine with their significance.

5. Write the biological and clinical significance of the transamination reaction.

6. What is a folate trap? Explain by drawing reactions.

7. Why night blindness may be seen in patients with post-hepatic jaundice?

8. Explain why barbiturates precipitate an attack of porphyria and why administration of glucose alleviates symptoms of porphyria.

9. Write the principle of electrophoresis. Draw a normal electrophoretogram of plasma proteins.

10. Vitamin B12 deficiency leads to neurological manifestations. Justify.

11. Write any two post-transcriptional modifications with significance.

SECTION C

Q.4 Short Answer Questions (4 out of 5) **4*5=20**

1. Describe mechanisms of regulation of enzyme activity.

2. Describe steps and clinical applications of DNA recombinant technology (3+2)

3. Describe at least ten tumor markers with their clinical significance.

4. Enumerate cardiac biomarkers in the order of their earliest rise in myocardial infarction. What is a flipped pattern? Describe cardiac biomarkers that are not enzymes. (1+1+3)

5. Describe the mechanisms of action of hormones.

Q.5 Clinical Cases (2 out of 2) **2*10=20**

1. A 40 years-old male, with a history of smoking cigarettes (a pack a day), who developed a chronic progressive condition of shortness of breath and incapability of sustaining any physical activity, was referred to a respiratory physician. After a physical examination and laboratory investigations, a diagnosis of emphysema without any evidence of cancer arrived. The serum alpha-1 antitrypsin levels were very low.

    1. What is alpha-1 antitrypsin? (1)

    2. Why is it also called a protease inhibitor and what is its mechanism of action? (2)

    3. What is the effect of smoking on alpha-1 antitrypsin and why the deficiency of this protein also may lead to liver disease? (2)

4. What do you mean by positive acute phase proteins and give two examples (apart from one mentioned in the case) and their importance. (2)

5. Write any two negative acute phase proteins. (1)

6. What are the functions of haptoglobin and why do decreased levels of this protein lead to hemolyticanemia? (2)

2. A 30-year-old man has recurrent arthritic attacks. On examination signs of inflammation were present in several joints. Serum uric acid was grossly elevated, as was the urinary excretion of this compound. Further investigation revealed the deposition of urate crystals in the inflamed joints and tissues. Treatment was started with allopurinol at a daily dose of 50 mg twice a day. For 2-3 weeks, the dose was gradually increased to 400 mg per day. Ibuprofen was added to control pain and inflammation.

1. What is the biochemical reason behind the development of inflammation around the joints? (2)

2. Write two primary and two secondary causes for raised uric acid levels in our body. (2)

3. What is the rationale behind treating this patient with allopurinol? Write the mechanism of action of allopurinol. (2)

4. Alcohol precipitates an attack of Gout. Why? (2)

5. Write the normal blood level of uric acid in males and females. (2)

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2406000101020601
EXAMINATION AUGUST 2024
FIRST MBBS
PHYSIOLOGY (PAPER - I) (NEW) - LEVEL 2

[Time: As Per Schedule] **[Max. Marks: 100]**

Instructions:
1. **Fill up strictly the following details on your answer book**
   a. Name of the Examination: **FIRST MBBS**
   b. Name of the Subject: **PHYSIOLOGY (PAPER - I) (NEW) - LEVEL 2**
   c. Subject Code No: **2406000101020601**
2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.

Seat No:

Student's Signature

SECTION A

Q.1 MCQs: **20**

1. Which structure within the cell produces ATP (adenosine triphosphate)?
   A. The mitochondria
   B. The nucleus
   C. Peripheral proteins
   D. The endoplasmic reticulum

2. Which cell organelles contain an acidic environment capable of digesting a wide variety of molecules?
   A. Lysosomes
   B. Ribosomes
   C. Centrosomes
   D. Golgi complex

3. Which form of transport through the plasma membrane requires the expenditure of energy by the cell?
   A. Facilitated diffusion
   B. Osmosis
   C. Active transport
   D. Diffusion

4. Most of the iron in the body is present in:

A. Hemoglobin
B. Myoglobin
C. Ferritin
D. Transferrin

5. Hereditary spherocytosis occurs due to mutations in genes coding for:

A. Spectrin and ankyrin
B. Na*-K+ ATPase
C. Glucose 6 phosphate dehydrogenase
D. Pyruvate kinase

6. Heme is converted to bilirubin mainly in the:

A. Kidneys
B. Liver
C. Spleen
D. Bone marrow

7. One of the following processes is NOT part of mechanical digestion. Which One?

A. Hydrolysis
B. Peristalsis
C. Segmentation
D. Mastication

8. Which type of cell produces hydrochloric acid in stomach?

A. Zymogenic cells
B. Parietal cells
C. Chief cells
D. Enteroendocrine cells

9. What is the most important role of gastrin in the digestive system?

A. To stimulate release of bile and pancreatic juice
B. To stimulate gastric secretion
C. To activate pepsinogen
D. To hydrolyse proteins to polypeptides

10. Of the events that lead to myofilaments sliding over each other, which of the following happens first?

A. The myosin head engages with the binding site on actin
B. Troponin changes shape and pulls on tropomyosin
C. Calcium ions enter the cell cytoplasm
D. ATP is hydrolysed to ADP and inorganic phosphate

11. Smooth muscle cells may be described by which of the following?

A. Striated, voluntary, multinucleate
B. Not striated, voluntary, multinucleate
C. Striated, involuntary, uninucleate
D. Not striated, involuntary, uninucleate

12. Which of the following structures has the slowest rate of conduction of the cardiac action potential?
    A. Arterial muscle
    B. Atrioventricular bundle fibers
    C. Purkinje fibers
    D. Ventricular muscle

13. In a resting adult, the typical ventricular ejection fraction has what value?
    A. 20 percent
    B. 30 percent
    C. 60 percent
    D. 80 percent

14. The P.R. interval in an ECG is measured by finding the interval between the:
    A. Beginning of P wave and the beginning of the QRS complex
    B. End of the P wave and beginning of the QRS complex
    C. Beginning of the P wave and the end of the QRS complex
    D. End of the P wave and the end of the QRS complex

15. The Second heart sound is produced by:
    A. Closure of the aortic and pulmonary valves
    B. Opening of the aortic and pulmonary valves
    C. Closures of the mitral and tricuspid valves
    D. Opening of the mitral and tricuspid valves

16. Which part of the nephron is impermeable to water?
    A. Proximal convoluted tubule
    B. Distal convoluted tubule in the presence of ADH
    C. Ascending limb of the loop of Henle
    D. Descending limb of the loop of Henle

17. Which of the following happens as we descend deeper into the kidney medulla?
    A. The concentration of the interstitial fluid doesn't change
    B. The concentration of the interstitial fluid increases
    C. The concentration of the filtrate within the tubule increases
    D. The concentration of the interstitial fluid decreases

18. What is the function of the cilia on the cells that line the bronchial tree?
    A. They help mix the inhaled fresh air with the residual air contained in the bronchial tree.
    B. They slow the movement of air to allow for efficient exchange of gases.
    C. They move the mucus on the cell surface up out of the bronchial tree.
    D. They filter particles from inhaled air.

19. One of the following statements is correct. Which one?
    A. The visceral pleura is attached to the chest wall and the parietal pleura is attached to the lung.
    B. The two lungs and their associated structures are known as the pneumothorax.
    C. The hilum is a serious membrane that surrounds each lung separately.
    D. A negative pressure is maintained between the two lung pleura.

20. What term is applied to the volume of air that moves into the lungs while breathing at rest?
    A. Anatomical dead space
    B. Inspiratory reserve capacity
    C. Tidal volume
    D. Residual volume

SECTION – B

40

Q.2 Long Answer Questions: **10**

A 18-year-old girl complaints of breathlessness on exertion, increased fatigue, loss of appetite, on examination there is pallor,tachycardia and Hb levels of 8 gms /dl.

a. Write the diagnosis in the given case. (1 marks)
b. Give the etiological classification of above condition? (4 marks)
c. What other investigations you will do for specific diagnosis. (2 marks)
d. What are the possible treatments? (3 marks)

Q.3 Answer in Short (Any 5 out of 6) **5*3=15**

a. Types and functions of T-cells.
b. Distribution of body water in different body fluid compartments
c. Regulation of cardiac output
d. Chloride shift
e. Stages of gastric secretion.
f. Importance of Empathy in managing patient

Q.4 Short notes (Any 3 out of 4) **3*5=15**

a. Homeostasis.
b. Venous return.
c. Blood transfusion.
d. Pancreatic secretions.

SECTION – C **40**

Q.5 Long Answer Question: **1*10=10**

Define blood coagulation and describe the Extrinsic Pathway of blood coagulation, with a mention on intravascular anticoagulation mechanism. (2+5+3)

Q.6 Answer in Short: (Any 5 out of 6) **5*3=15**

a) Motor units
b) Bohr's Effect
c) Lung Compliance
d) Sino - Atrial Node
e) Sarcomere
f) Albumin

Q.7 Short notes: (Any 3 out of 4) **3*5=15**

a) Gastrointestinal Hormones.
b) Glomerular Filtration Rate.
c) Cardiac Cycle.
d) Acclimatization.

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2406000101020602
EXAMINATION AUGUST 2024
FIRST MBBS
PHYSIOLOGY (PAPER - II)(NEW) - LEVEL 2

[Time: As Per Schedule] **[Max. Marks: 100]**

Instructions:
1. **Fill up strictly the following details on your answer book**
   a. Name of the Examination: **FIRST MBBS**
   b. Name of the Subject: **PHYSIOLOGY (PAPER - II) (NEW) - LEVEL 2**
   c. Subject Code No: **2406000101020602**
2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.

Seat No:

Student's Signature

Section A

Q.1 MCQ **20**

1. C-AMP acts through
   A. Activation of protein kinase
   B. Activation of adenylate cyclase
   C. Increased calcium release
   D. PIP3 pathway

2. Overall regulating organ for neuro-endocrinal system is
   A. Hypothalamus B. Pituitary
   C. Thalamus D. Pineal gland

3. The primary physiological effect of insulin seems to be:
   A. Decreased glycogen synthesis in the liver
   B. Increased glucose uptake by the brain
   C. Decreased lipid synthesis in the liver
   D. Increased glucose uptake by many different tissues

4. Ovulation coincides with:
   A. Increased progesterone B. GnRH release
   C. LH surge D. Decreased oestrogen

5. Mechanism of action of Intrauterine contraceptive device (IUCD) is based on
   A. It prevents fertilized ovum implantation in the endometrium
   B. It inhibits ovulation
   C. It blocks the entry of sperms in female genital tract
   D. It promotes anovulatory cycles

6. Average weight gain during whole of pregnancy is:
   A. 5-7.5 Kg
   B. 6.5-8.5 Kg
   C. 10-12.5 Kg
   D. 13-15 Kg

7. Which of the following transmitter substances almost always tend to inhibit the post- synaptic neuron:
   A. Gamma-amino butyric acid (GABA)
   B. Dopamine
   C. Glycine
   D. Norepinephrine

8. Weber Fechner's law deals with:
   A. Frequency discrimination
   B. Receptive field organization
   C. Intensity discrimination
   D. Two-point discrimination

9. Lower motor neuron is characterized by all **EXCEPT**:
   A. Usually a single muscle is involved
   B. Flaccid paralysis
   C. Muscle atrophy is not severe
   D. Deep reflexes are absent

10. Pyramidal tracts originate in all of the following **EXCEPT**:
   A. Somatosensory cortex
   B. Premotor cortex
   C. Motor cortex
   D. Red nucleus

11. Thalamus is the relay center for all of the following **EXCEPT**:
   A. Smell
   B. Proprioception
   C. Pain
   D. Temperature

12. Most of the refraction that occurs in the eye
    A. Anterior surface of the cornea
    B. Posterior surface of cornea
    C. Anterior surface of lens
    D. Posterior surface of lens

13. In athletes bradycardia is because of
    A. Increased sympathetic tone
    B. Increased vagal tone
    C. Decreased venous return
    D. increased cardiac output

14. Cerebellar nystagmus occurs with damage to
    A. Vermis
    B. Flocculonodularlobe
    C. Anterior lobe
    D. Posterior lobe

15. Tremors associated with cerebellar disease are:
    A. Present at rest
    B. Present with action
    C. Restricted to hands and trunk
    D. Present during sleep

16. The arrangement of three minute ear ossicles across the cavity from tympanic membrane to oval window is :
    A. Malleus-incus-stapes
    B. Malleus-stapes-incus
    C. Stapes-incus-malleus
    D. Incus-stapes-malleus

17. Extrapyramidal tract includes all **EXCEPT**:
    A. Rubrospinal tract
    B. Tectospinal tract
    C. Corticospinal tract
    D. Medial longitudinal fasciculus

18. Accidental removal of parathyroid glands during thyroidectomy results in:
    A. Hypercalcemia
    B. Tremors and muscle spasms
    C. Myxedema
    D. Fall in BMR

19. All are seen in cushing's syndrome **EXCEPT**:
    A. Truncal obesity
    B. Hypertension
    C. Hypoglycemia
    D. Hirsutism

20. Total removal of thyroid gland in adults produces:
    A. Dwarfism
    B. Mental retardation
    C. Poor resistance to cold
    D. Sexual retardation

Section B

Q.2 Long Answer Questions **10**

A 30 yrs. old male patient reports to the surgical Out Patient Department with the complaints of increased body temperature and perspiration. He also complained of increase in appetite and weight loss along with sleep disturbance since last six months. On inspection the eyes were prominent along with a small nodular swelling in the neck.

a. What is the likely condition? **2**
b. What investigations are needed to establish diagnosis? **3**
c. What is the patho-physiology behind the condition? **3**
d. What are the possible treatments? **2**

Q.3 Answer in Short (Any 5 out of 6) **5*3=15**

a. Cholinergic receptors.

b. Heat loss mechanism.

c. Three important actions of aldosterone.

d. Function of corpus leutium.

e. Broca's area.

f. Conductive deafness.

Q.4 Short notes (Any 3 out of 4) **3*5=15**

a. Wallerian degeneration.

b. Properties of reflex action.

c. Function of cortisol.

d. Ovarian cycle.

Section C

Q.5 Long Answer Question **1*10=10**

Enlist the hormones involved in calcium metabolism. Describe the mechanism of action, functions and regulation of parathormone. **2+2+3+3=10**

Q.6 Answer in Short (Any 5 out of 6) **5*3=15**

a) Sertoli cell.

b) Functions of growth hormone.

c) Aqueous humor.

d) Analgesic system.

e) Aphasia.

f) Paradoxical sleep.

Q.7 Short notes (Any 3 out of 4) **3*5=15**

a) Menstrual cycle

b) Mechanism of Hearing

c) Functions of sympathetic nervous system.

d) Functions of Hypothalamus.

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