



RAN - 2006000101010001

RAN-2006000101010001

1st MBBS Examination November - 2023

Human Anatomy : Paper - I

Set - 2 (New CBME)

Time: 3 Hours]

[Total Marks: 100

સૂચના : / Instructions

(1)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.

Fill up strictly the details of signs on your answer book

Name of the Examination:

1st MBBS

Name of the Subject :

Human Anatomy : Paper - I - Set - 2 (New CBME)

Subject Code No.: 2006000101010001

Seat No.:

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Student's Signature

- (2) Write each section in separate answer sheet.
- (3) Draw neat and labelled diagrams wherever necessary.
- (4) Figure to the right indicates maximum marks.
- (5) In section A, all MCQs are compulsory, only one answer will be accepted, no Negative marking and answers will be marked with blue / black pen on OMR sheet and must be submitted within 30 minutes.

Section - A : MCQ

20 Marks

1. Which of the following is not the modification of deep fascia — ?
 - A. Extensor retinaculum
 - B. Extensor digital expansion
 - C. Flexor retinaculum
 - D. Fibrous flexor sheath
2. Which dermatome overlies the thumb — ?
 - A. T1
 - B. C5
 - C. C6
 - D. C7
3. Anterior dislocation of the lunate leads to injury of —
 - A. Median nerve
 - B. Ulnar nerve
 - C. Radial nerve
 - D. Anterior interosseous nerve

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[1]

[P.T.O.]

P1514

4. A 3 year old boy was brought to the emergency with fracture and avulsion of medial epicondyle of humerus. Which of the following nerve should be tested for injury — ?
 - A. Median nerve
 - B. Ulnar nerve
 - C. Radial nerve
 - D. Musculocutaneous nerve
5. Axillary sheath is derived from —
 - A. Pretracheal fascia
 - B. Pharyngobasilar fascia
 - C. Investing layer of deep cervical fascia
 - D. Prevertebral fascia
6. The following nerve hooks around the spinal accessory nerve —
 - A. Lesser occipital
 - B. Greater occipital
 - C. Great auricular
 - D. Supraclavicular
7. All of the following are the branches of external carotid artery except —
 - A. Superior thyroid artery
 - B. Ascending pharyngeal artery
 - C. Transverse cervical artery
 - D. Lingual artery
8. All of the following are true about the location of otic ganglion except —
 - A. Inferior to foramen ovale
 - B. Lateral to mandibular nerve
 - C. Lateral to tensor veli palatine
 - D. Anterior to the middle meningeal artery
9. The ligament of Berry fixes the thyroid gland to —
 - A. Thyroid cartilage
 - B. Hyoid bone
 - C. Cricoid cartilage
 - D. Conus elasticus
10. The superficial relation of hyoglossus muscle include all except —
 - A. Lingual nerve
 - B. Lingual artery
 - C. Hypoglossal nerve
 - D. Deep part of submandibular gland
11. Following is the modification of pia mater —
 - A. Ependyma
 - B. Linea splendens
 - C. Septum pellucidum
 - D. Fornix

12. Which of the following is not a branch of internal carotid artery — ?
- | | |
|----------------------------|-----------------------|
| A. Posterior communicating | B. Anterior choroidal |
| C. Posterior choroidal | D. Anterior cerebral |
13. Supramarginal gyrus is located in —
- | | |
|----------------------------|-----------------------------|
| A. Inferior frontal gyrus | B. Superior frontal gyrus |
| C. Inferior temporal gyrus | D. Inferior parietal lobule |
14. Olfactory receptor cells are —
- | | |
|--------------------------|----------------------|
| A. Unipolar neurons | B. Bipolar neurons |
| C. Pseudounipolar neuron | D. Multipolar neuron |
15. Which of the following is not the feature of hyaline cartilage — ?
- | |
|---|
| A. Chondrocytes in lacunae |
| B. Chondrocytes arranged in clusters (isogenous groups) |
| C. Lightly stained territorial matrix |
| D. Found in costal cartilage |
16. Tunica adventitia is thickest in which of the following blood vessel —
- | | |
|------------------------|---------------------|
| A. Large sized artery | B. Large sized vein |
| C. Medium sized artery | D. Arteriole |
17. During spermatogenesis, Second meiotic division gives rise to —
- | | |
|--------------------------|----------------------------|
| A. Primary spermatocytes | B. Secondary spermatocytes |
| C. Spermatids | D. Spermatozoa |
18. 1st pharyngeal cleft forms —
- | | |
|-----------------------------|-----------------------------|
| A. Internal auditory meatus | B. External auditory meatus |
| C. Tympanic cavity | D. Epitympanic recess |
19. Muscle with parallel fibres are all except —
- | | |
|----------------|----------------------|
| A. Sartorius | B. Rectus abdominis |
| C. Sternohyoid | D. Tibialis anterior |
20. Which one of the following is the example of capacitance vessel — ?
- | | |
|--------------------|---------------|
| A. Elastic artery | B. Large vein |
| C. Muscular artery | D. Arteriole |

Section - B

16 Marks

Q. 2. Case base question. (2 out of 3)

- A. A 40 years old female suddenly developed inability to move her left upper limb and left lower limb and also complain of double vision. On examination lateral squint was observed in right eye. It was diagnosed as a vascular lesion in the brain stem. (2 + 3 + 3)
1. Specify the anatomical structures involved.
 2. Draw a labeled diagram at the level of lesion and name the syndrome.
 3. Give the anatomical basis of the sign and symptoms.
- B. A carpenter injured his right index finger by sharp iron nail. After about 3 days, he developed fever and his right index finger was swollen and painful. (1 + 2 + 2 + 3)
1. Name the structure in the index finger that is likely to be inflamed.
 2. What is this clinical condition called? If the condition is neglected or not treated then what happened.
 3. The infections of which fingers are more dangerous and why.
 4. Write a note on extensor digital expansion.
- C. A 26 year old woman survived he knife attack, but was injured in the neck. She was rushed to the hospital as having profuse bleeding. On examination, it was found there was no deep cut in the neck. She was breathless, cyanotic and had low blood pressure. On auscultation, churning and splashing sounds masked the normal heart sounds. The physician suspected venous air embolism. (1 + 2 + 5)
1. Name the vein that is injured & exposed to atmospheric air.
 2. Give the anatomical reason why vein was not able to contract after injury.
 3. Describe the formation, termination and tributaries of the injured vein.

Q. 3. A. Write short note on any 2 out of three.

10 Marks

- a. Rotator cuff and its applied aspect.
- b. Posterior interosseous nerve – its origin, course, muscle supplied and applied aspect.
- c. Define anastomosis. Write a note on anastomosis around elbow joint.

B. Write short note on.

10 Marks

- a. First arch syndrome.

OR

Intra-embryonic mesoderm.

- b. Development of Adrenal gland with its clinical correlation.

OR

Development of Face and its anomalies.

C. Write short note on any one out of two.

4 marks

1. Describe the components of lymphatic system.
2. Classification of muscle according to their arrangement of muscle fibres.

Section - C

Q. 4. Write a note on any 2 out of 3.

16 marks

- i. Describe mandibular nerve in details. Add a note on connections of otic ganglion.
- ii. Constrictor muscles of pharynx - origin, insertion, nerve supply, structures passing between the constrictors with applied aspect Write a note on sinus morgagni.
- iii. Scalp under following heading - Nerve supply, Blood supply and venous drainage. Write a note on safety valve haematoma.

Q. 5. A. Write a short note. (2 out of 3)

10 Marks

1. Explain visual reflexes.
2. Describe cavernous sinus under following headings —
 - (a) Location and formation
 - (b) Relations
 - (c) Contents
 - (d) Communications
 - (e) Applied aspect
3. Draw a well labeled diagram showing Sulci, gyri and functional areas on the superolateral surface of the cerebral hemisphere.

B. Write short Note.

10 Marks

- 1) Histology of Transitional epithelium or Histology of Dorsal root ganglion.
- 2) Histology of Pituitary gland or Histology of Cerebellum.

C. Short note. (any one)

4 Marks

1. Describe different types of glial cells with their functions.
 2. Growth of a long bone.
 3. Implantation.
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RAN - 2006000101010002

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1st MBBS Examination November - 2023

Human Anatomy : Paper - II

Set - 3 (New CBME)

Time: 3 Hours]

[Total Marks: 100

સૂચના : / Instructions

(1)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.

Fill up strictly the details of signs on your answer book

Name of the Examination:

1st MBBS

Name of the Subject :

Human Anatomy : Paper - II - Set - 3 (New CBME)

Subject Code No.: 2006000101010002

Seat No.:

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Student's Signature

- (2) Write each section in separate answer sheet.
- (3) Draw neat and labelled diagrams wherever necessary.
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Section - A : MCQ

20 Marks

1. Cystic fibrosis is —
 - A. Autosomal dominant disorder
 - B. Autosomal recessive disorder
 - C. X-Linked recessive disorder
 - D. X-Linked dominant disorder
2. When a segment of DNA is transferred from one non-homologous chromosome to another, it is called —
 - A. Deletion of a segment of DNA
 - B. Duplication of a segment of DNA
 - C. Inversion of a segment of DNA
 - D. Translocation of a segment of DNA

3. All the parts of GIT are solely derived from foregut except —
 - A. Stomach
 - B. Esophagus
 - C. Duodenum
 - D. Pharynx
4. Dorsal pancreatic bud forms all parts of the pancreas, except —
 - A. Upper part of head
 - B. Body
 - C. Tail
 - D. Uncinate process
5. While observing a histology slide of testis, the student notices a row of cells resting on the basement membrane of the seminiferous tubule. Which of the following cells were observed by the student — ?
 - A. Spermatids
 - B. Spermatogonia
 - C. Primary spermatocyte
 - D. Leyding cells
6. Which is true regarding the portal lobule of the liver — ?
 - A. It is hexagonal in shape
 - B. Central vein present in the centre
 - C. Bile flows towards the centre of the lobule
 - D. Plates of hepatocytes appear radiating from the centre of the lobule
7. Nerve likely to be injured in posterior dislocation of the hip joint is —
 - A. Superior gluteal nerve
 - B. Sciatic nerve
 - C. Inferior gluteal nerve
 - D. Pudendal nerve
8. Regarding peroneus longus, which statement is not correct — ?
 - A. It arises from the fibula
 - B. It grooves the cuboid bone
 - C. It passes deep to both superior and inferior peroneal retinaculum
 - D. It is inserted into the base of the 5th metatarsal
9. Anteroposterior stability of the knee joint is maintained by —
 - A. Oblique popliteal ligament
 - B. Arcuate popliteal ligament
 - C. Cruciate ligaments
 - D. Medial and lateral collateral ligaments
10. Largest and most important branch of the posterior tibial artery is —
 - A. Circumflex fibular artery
 - B. Peroneal artery
 - C. Lateral planter artery
 - D. Medial planter artery

11. All are the muscles of the third layer of sole except —
 - A. Flexor hallucis brevis
 - B. Adductor hallucis
 - C. Abductor hallucis
 - D. Flexor digiti minimi brevis

12. All statements are correct about thoracic duct except —
 - A. It begins as an upward continuation of cistern chili
 - B. It enters the thoracic cavity through an aortic opening in the diaphragm
 - C. It crosses the vertebral column from right to left side in front of T5 vertebra
 - D. It terminates in the external jugular vein

13. Foramen secundum is present in —
 - A. Septum secundum
 - B. Septum primum
 - C. Septum intermedium
 - D. Septum spurium

14. Anteriorly the trachea is related to aU except —
 - A. Arch of aorta
 - B. Left brachiocephalic vein
 - C. Oesophagus
 - D. Deep cardiac plexus

15. All are correct regarding oblique sinus of pericardium except —
 - A. It is the recess of pericardial cavity
 - B. It lies behind the left atrium
 - C. It lies behind the right atrium
 - D. It is closed on all sides except below

16. The neurovascular plane in the anterior abdominal wall lies between —
 - A. External & internal oblique muscles
 - B. Internal & trans verses abdominis muscles
 - C. Transverses abdominis muscle & fascia transversalis
 - D. Fascia transversalis & parietal peritoneum

17. All statements are correct about psoas major muscle except —
 - A. It arises from all the lumbar vertebrae
 - B. It contains the lumbar plexus within the substance
 - C. It is pierced by the genitofemoral nerve
 - D. It is the chief extensor of the hip joint

18. All are the tributaries of inferior vena cava except —
 A. Right suprarenal vein B. Left suprarenal vein
 C. Right renal vein D. Left renal vein
19. All statements are correct about duodenum except —
 A. It is the most fixed part of the small intestine
 B. It is about 25 cm long
 C. It extends below the level of umbilicus
 D. It produces an impression on the visceral surface of the liver
20. The posterior surface of the head of pancreas is related to all except —
 A. Inferior vena cava B. Aorta
 C. Terminal parts of renal veins D. Bile duct

Section - B

- Q. 2. Case base question (2 out of 3). 16 Marks**
- A. A 20 year old healthy male went to recruitment in the Army. He fulfilled all the physical requirements except that he was having flat feet, so he was rejected. (1 + 2 + 1 + 2 + 2)
1. What is flat foot?
 2. Give the anatomical basis of the collapse of the medial longitudinal arch.
 3. What is the keystone of the medial longitudinal arch?
 4. What are the effects of flat foot?
 5. Define inversion and eversion movements; name the joints where these movements take place.
- B. A 65 year old man who suffered myocardial infarction was admitted to the cardiothoracic surgery ward for coronary bypass surgery. The surgeon used patient's long saphenous vein and reversed it for bypass surgery. (1 + 1 + 1 + 1 + 2 + 2)
1. What is myocardial infarction?
 2. What is coronary bypass surgery?-
 3. Why was the long saphenous vein used in coronary bypass surgery?
 4. Why was the implanted segment of the long saphenous vein reversed?
 5. Name the arteries supply the cardiac muscle & mention their origin.
 6. What is the difference between the angina pectoris & myocardial infarction (MI)?

- C. A 15-year-old (riding a bicycle) got an accident. He was hit in the perineum with a sharp object. He did not pass urine after the trauma, during examination, the urethra was crushed against the edge of the pubic bones. The urine reaches deep to the anterior abdominal wall but not into the thigh. The rupture of urethra was diagnosed. (1 + 2 + 2 + 1 + 2)

1. What is the length and extent of male urethra?
2. Enumerate the parts of male urethra and the region of their location. Which part of urethra is the narrowest & least dilatable?
3. Give the reason of extravasation of urine deep to the anterior abdominal wall.
4. What prevents the urine from entering the thigh from the anterior abdominal wall?
5. Write about sphincters of the urethra.

Q. 3. A. Write short note on any 2 out of 3. 10 Marks

1. Common peroneal nerve - origin, course, Branches and its applied aspect.
2. Menisci in details with their function. Which meniscus is more prone to injury and why?
3. Femoral sheath in details. Add a note on anatomical basis of femoral hernia.

B. Write short note on – 10 Marks

1. Comparison between Microscopic features of thick and thin skin or Comparison between Microscopic features of skeletal and cardiac muscle.
2. Microscopic features of lung. Add a note on pneumocytes or Microscopic features of kidney.

C. Short note on any one out of two. 4 Marks

1. Various tests used for prenatal diagnosis.
2. Autosomal recessive disorder.

Section - C

Q. 4. Write short note on any two out of 3. 16 Marks

1. Describe inguinal canal in detail and its mechanisms to maintain the integrity of the inguinal canal. Write down the difference between direct and indirect inguinal hernia.

2. Describe portal vein in details. Give the different sites and anatomical basis of portocaval anastomosis.
3. Describe uterus under following - location and parts, axis, relations and blood supply. Add a note on anatomical basis of prolapse of uterus.

Q. 5. A. Write short note on any two out of 3.

10 Marks

1. Superior vena cava - its formation, course, tributaries, termination. What happened if superior vena cava gets blocked?
2. Describe pleura. Add a note on anatomical basis of pleural effusion.
3. Describe posterior Mediastinum. Add a note on mediastinal syndrome.

B. Write short note on any two out of 3.

10 Marks

1. Coarctation of aorta
2. Hypospadias
3. Development of pancreas and its anomalies.

C. Write short note on any one.

4 Marks

1. Barium studies
 2. Describe professional qualities and roles of a physician
 3. Bony landmarks for inferior extensor retinaculum in lower limb and structures passing beneath it.
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RAN - 2006000101020001

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1st MBBS Examination November - 2023

Physiology : Paper - I

Set - 3

Time: 3 Hours]

[Total Marks: 100

સૂચના : / Instructions

(1)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.

Fill up strictly the details of signs on your answer book

Name of the Examination:

1st MBBS (Physiology)

Name of the Subject :

Physiology : Paper - I - Set - 3

Subject Code No.: 2006000101020001

Seat No.:

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Student's Signature

Section - A : MCQ

20 Marks

- 1) Normal albumin-globulin (A / G) ratio in blood is :
A. 1.7:1 B. 1:1.7
C. 7:1.1 D. 1:7.1
- 2) Radio labelled Inulin is used to measure :
A. ECF volume B. ICF volume
C. Total body water volume D. Interstitial fluid volume
- 3) Saturation Kinetics is observed in All of the following EXCEPT
A. Facilitated Diffusion B. Na⁺ – Ca⁺ Exchanger
C. Simple Diffusion D. Na⁺ coupled Active Transport
- 4) Which hormone stimulates a feeling of hunger
A. Gastrin B. Cholecystokinin
C. Leptin D. Ghrelin

- 5) A large greasy, smelly, pale stool usually indicates failure of digestion of :
- | | |
|------------------|--------------|
| A. Carbohydrates | B. Fats |
| C. Proteins | D. Cellulose |
- 6) All of the following are true about the Auerbach plexus, EXCEPT
- It is located in the submucosa of hollow organs of the alimentary canal
 - It helps to maintain movements of the gastrointestinal tract
 - It's function is mediated by nitric oxide
 - Its function is mediated by acetylcholine
- 7) Adherens junctions are specialized cell junctions that formed by linking, the _____ to transmembrane proteins known as _____.
- microtubule cytoskeleton ... cadherins
 - microtubule cytoskeleton ... integrins
 - intermediate filament cytoskeleton ... integrins
 - actin cytoskeleton ... cadherin
- 8) The motor unit is :
- Muscle fibre and neurons supplying it
 - Ventral horn cells along with its motor nerve
 - Single motor neuron and all the muscle fibres it supplies
 - Single muscle fibre with its nerve
- 9) Molecular motors are :
- | | |
|------------------------------|---------------------|
| A. Calmodulin and G proteins | B. Dyneinandkinesin |
| C. Myosinandmyoglobin | D. Troponin |
- 10) Sequence of events involved during phagocytic mechanism is :
- Chemotaxis - Diapedesis - Opsonization - Phagocytosis
 - Diapedesis - Opsonization - Chemotaxis - Phagocytosis
 - Diapedesis - Chemotaxis - Opsonization - Phagocytosis
 - Phagocytosis - Diapedesis - Chemotaxis - Opsonization
- 11) Cardiovascular changes that occur during inspiration include :
- Decreased heart rate
 - Decreased right ventricular filling
 - Decreased right ventricular output
 - Increased blood returning to the heart

- 12) Which of the following is **NOT TRUE** regarding von Willebrand's factor?
- Regulates circulating level of factor VIII
 - Produced by endothelial cell
 - Prevents adhesion of platelets with collagen
 - Factor VIII gets activated after separating from it
- 13) Reabsorption of Na^+ from tubular fluid is dependent on a carrier protein situated on apical membrane of ascending limb of Henle
- $\text{Na}^+ - \text{K}^+$ pump
 - $\text{Na}^+ - \text{Cl}^-$ symporter
 - $\text{Na}^+ - \text{K}^+ - 2\text{Cl}^-$ cotransporter
 - $\text{Na}^+ - \text{H}^+$ antiporter
- 14) Creatinine is **not ideal** to measure GFR in humans because?
- It is toxic
 - Some of it is secreted by tubules
 - Not freely filtered
 - Affects filtration rate
- 15) Protein, after synthesis is stored in :
- | | |
|--------------------|-----------------|
| A. Golgi apparatus | B. SER |
| C. RER | D. Mitochondria |
- 16) Which of the following is part of the reflex response to an increase in arterial pressure?
- Decreased firing of carotid sinus baroreceptors
 - Increased sympathetic activity to the ventricles
 - Increased parasympathetic activity to the SA Node
 - Increased parasympathetic activity to the arterioles of skeletal muscles and skin
- 17) Venous Return :
- Increases on standing
 - Decreases by deep inspiration
 - Decreases by venoconstriction
 - When increased, activates Bainbridge reflex

- 18) Decompression sickness :
- Results from CO₂ bubbles in the body fluids
 - Can be prevented by rapid decompression
 - Is characterized by pains and sometimes paralysis
 - Can occur if one descends a mountain too rapidly
- 19) Functional residual capacity of lung is :
- Volume expired after normal expiration
 - Volume remaining after forced expiration
 - ERV + RV
 - Tidal volume + volume inspired forcefully
- 20) Following is also known as "last ditch stand"
- Cushing reaction
 - Baroreceptor response
 - CNS ischemic response
 - Chemoreceptor response

Section - B

40 Marks

Q. 1. Long Answer Questions.

(10 marks)

A 60-year-old chronic smoker man with history of 1 pack of cigarettes per day for the past 47 years presents to respiratory medicine OPD with progressive shortness of breath and chronic cough with yellowish sputum, for the past 2 years. On examination, he appears cachectic and in moderate respiratory distress, especially after walking to the examination room, and has pursed-lip breathing. His neck veins are mildly distended. Lung examination reveals a barrel shaped chest and poor air entry bilaterally, with moderate inspiratory and expiratory wheezing. Cardiovascular and abdominal examination are within normal limits. Lower extremities exhibit scant pitting edema.

- What type of lung disorder is the man suffering from? (1 mark)
- Describe the structural changes in his respiratory system and their physiological basis. (3 marks)
- What is the likely cause of neck vein distention and pitting edema in legs? (2 marks)
- Describe the Pulmonary Function Tests that you would advise for this patient? (4 marks)

- Q. 2. Answer in Short. (Any 5 out of 6) (5 × 3 = 15 marks)**
- a. Rh blood group
 - b. Facilitated diffusion
 - c. Juxtamedullary nephron
 - d. Hypovolemic shock
 - e. Doctor patient relationship
 - f. Stokes-Adams syndrome

- Q. 3. Short notes. (Any 3 out of 4) (3 × 5 = 15 marks)**
- a. Heart sounds
 - b. Mismatched blood transfusion
 - c. Gastric emptying
 - d. Functions of bile

Section - C

40 Marks

- Q. 4. Long Answer Questions. (1 + 7 + 2 = 10 marks)**
- Define Homeostasis with relevant example. Explain negative and positive feedback mechanism. What is feed back gain?

- Q. 5. Answer in Short. (Any 5 out of 6) (5 × 3 = 15 marks)**
- a. Compare and contrast: Isotonic contraction and Isometric contraction
 - b. Classification of Hypoxia
 - c. C. Principles for treatment of peptic ulcer
 - d. GFR
 - e. Bainbridge reflex
 - f. Functions of plasma protein

- Q. 6. Short notes. (Any 3 out of 4) (3 × 5 = 15 marks)**
- a. A V nodal delay
 - b. Digestion and absorption of Fats
 - c. Dead space
 - d. Functions of Proximal convoluted Tubule



RAN - 2006000101020002

RAN-2006000101020002**First MBBS Examination November - 2023****Physiology : Paper - II****Set - 2****Time: 3 Hours]****[Total Marks: 100****સૂચના : / Instructions**

- (1) નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the details of signs on your answer book

Name of the Examination:

First MBBS (Physiology - 2)

Name of the Subject :

Physiology : Paper - II - Set - 2

Subject Code No.: 2006000101020002

Seat No.:

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Student's Signature

Section - A**20 Marks**

- Proprioceptive sensation is lost if there is damage to :
 - Dorsal column
 - Cerebellum
 - Motor cortex
 - Basal ganglia
- All are features of upper motor neuron lesion EXCEPT :
 - Hypertonia
 - Muscle wasting
 - Babinski's sign is positive
 - Large number of muscles are involved
- All are characteristics of EPSP (excitatory post synaptic potential) EXCEPT :
 - It is a local potential
 - It follows all or none law
 - It cannot propagate
 - It does not have refractory period

- 4) Which type of inhibition is most commonly present in cerebellum
 - a) Direct synaptic inhibition
 - b) Renshaw cell inhibition
 - c) Feed forward inhibition
 - d) Presynaptic inhibition

- 5) Resting membrane potential of a large myelinated nerve is :
 - a) -10 mV
 - b) -55 mV
 - c) -90 mV
 - d) $+55\text{ mV}$

- 6) Parkinsonism is caused due to damage to :
 - a) Cerebellum
 - b) Hypothalamus
 - c) Spinal cord
 - d) Basal Ganglia

- 7) Formation of blood brain barrier is function of :
 - a) WBC
 - b) Oligodendrocyte
 - c) RBC
 - d) Astrocytes

- 8) Hormones produced by Hypothalamus are all EXCEPT :
 - a) Thyroid releasing hormone
 - b) Growth hormone releasing hormone
 - c) Corticotropin releasing hormone
 - d) Follicle stimulating hormone

- 9) Oxytocin is secreted by :
 - a) Paraventricular nucleus
 - b) Supra optic nucleus
 - c) Anterior nucleus
 - d) Posterior nucleus

- 10) All are hyperglycemic hormones EXCEPT :
 - a) Growth hormone
 - b) Cortisol
 - c) Thyroid hormone
 - d) Insulin

- 11) Osteoclasts have specific receptors for :
 - a) Parathyroid hormone
 - b) Calcitonin
 - c) 1,25 dihydroxycholecalciferol
 - d) Insulin

- 12) Aldosterone escape is :
- Escape from the salt and water retaining effect of aldosterone
 - Escape of aldosterone from the stimulating effect of ACTH
 - Escape from the natriuretic effect of aldosterone
 - Escape of aldosterone from the stimulating effect of CRH
- 13) Testosterone is synthesized by :
- Sertoli cells
 - Mucus cells
 - Leydig cells
 - Germ cells
- 14) Sperms acquire motility when they pass through :
- Epididymis
 - Vas deference
 - Uterus
 - Seminiferous tubules
- 15) Source of progesterone during normal menstrual cycle is :
- Stroma
 - Surface epithelium of ovary
 - Corpus luteum
 - Endothelial cells
- 16) Which hormone is dominant in luteal phase of menstrual cycle :
- Prolactin
 - Oxytocin
 - Estrogen
 - Progesterone
- 17) The receptors for bitter taste are located at :
- Tip of tongue
 - Behind tip of tongue
 - Sides of tongue
 - Posterior part of tongue
- 18) Primary visual cortex lies in which part of cerebral cortex :
- Occipital lobe
 - Temporal lobe
 - Frontal lobe
 - Parietal lobe
- 19) Which of the following retinal cells generate action potential :
- Bipolar cells
 - Amacrine cells
 - Ganglionic cells
 - Horizontal cells
- 20) Which part of CNS play important role in temperature regulation :
- Reticular activating system
 - Spinal cord
 - Cerebellum
 - Hypothalamus

1. Case based question.

(10 marks)

History :

A 53 year old female patient complains of progressive weight gain of 8 kg in 1 year, fatigue, loss of memory, slow speech, deepening of her voice, dry skin, constipation, and cold intolerance.

Physical examination :

Vital signs include a temperature 96.8°F, pulse 58/minute and regular, BP 100/60. She is obese and speaks slowly and has a puffy face, with pale, cool, dry, and thick skin. The deep tendon reflexes are slow and reflex time is delayed. The serum T4 concentration is lower than normal value, the serum TSH is higher than normal value.

Questions :

- 1) What is the most likely diagnosis of the above clinical case? (1)
- 2) Which lab investigations, from the above case, support your diagnosis? (2)
- 3) What is the etiology (causes) of the condition? (2)
- 4) What are the clinical features related to the above condition? (5)

2. Notes. (3 out of 4)

(15 marks)

- 1) Spinothalamic tract
- 2) Apoptosis
- 3) Role of hypothalamus in temperature regulation
- 4) Hypermetropia

3. Short notes. (5 out of 6)

(15 marks)

- 1) Sertoli cells
- 2) Ovarian cycle
- 3) Parkinsonism
- 4) Regeneration of neuron
- 5) Endogenous pain inhibiting mechanism
- 6) Erlanger Gasser classification of nerve

Section - C

40 Marks

1. **Structured LAQ.** (10 marks)
 - 1) Describe mechanism of hearing with suitable diagram. (8)
 - 2) Write a note on types of deafness. (2)
2. **Notes. (3 out of 4)** (15 marks)
 - 1) Functions of Growth hormone.
 - 2) Normal sleep waves.
 - 3) Properties of reflexes.
 - 4) Receptor potential.
3. **Short notes. (5 out of 6)** (15 marks)
 - 1) Occlusion.
 - 2) Tests for ovulation.
 - 3) Acromegaly.
 - 4) Ionic basis of depolarization and repolarisation in neuron action potential.
 - 5) Visual adaptation.
 - 6) Aqueous humor.



RAN - 2006000101030001

RAN-2006000101030001**1st MBBS Examination November - 2023****Biochemistry : Paper - I****Set - 1****Time: 3 Hours]****[Total Marks: 100****સૂચના : / Instructions**

- (1) નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the details of signs on your answer book

Name of the Examination:

1st MBBS

Name of the Subject :

Biochemistry : Paper - I - Set - 1

Subject Code No.: 2006000101030001

Seat No.:

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Student's Signature

- (2) All questions are compulsory
(3) Each MCQ has only one correct answer
(4) One mark for correct answer. No negative marking.

Section - A : MCQ**20 Marks**

- The subcellular organelle known as 'Suicidal bag' is :
 - Peroxisome
 - Lysosome
 - Centrosome
 - Nucleosome
- Membrane lipids constitute:
 - Phospholipids
 - Sphingolipids
 - Cholesterol
 - All of the above
- The glycosaminoglycan found in synovial fluid is:
 - Hyaluronic acid
 - Heparin
 - Heparan sulphate
 - Keratan sulphate
- Which of the following carbohydrate(s) is/are not digested by humans?
 - Cellulose
 - Hemicellulose
 - Pectin
 - All of the above

5. The coenzyme of transketolase is :
 - a) TPP
 - b) PLP
 - c) NAD⁺
 - d) Biotin
6. Accumulation of sorbitol in tissue leads to :
 - a) Cataract formation
 - b) Peripheral neuropathy
 - c) Nephropathy
 - d) All of the above
7. Which of the following is Poly unsaturated fatty acid?
 - a) Palmitic acid
 - b) Palmitoleic acid
 - c) Linoleic acid
 - d) Oleic acid
8. The transport form of dietary lipids is :
 - a) Chylomicrons
 - b) Fatty acids
 - c) Monoacylglycerol
 - d) Triacylglycerol
9. Rate limiting step of fatty acid synthesis is :
 - a) Acetyl CoA carboxylase
 - b) Glycerol kinase
 - c) Hormone sensitive lipase
 - d) Co-lipase
10. The apolipoprotein specific for LDL is :
 - a) Apo B 100
 - b) Apo B 48
 - c) Apo C I
 - d) Apo C II
11. Acetyl CoA metabolite is derived from :
 - a) Carbohydrates
 - b) Proteins
 - c) Lipids
 - d) All of the above
12. Reference range of Serum total calcium is :
 - a) 8.5 – 10.5 mg/dL
 - b) 8.5 – 10.5 gm/dL
 - c) 8.5 – 10.5 mg/L
 - d) 8.5 – 10.5 gm/L
13. Hormone involved in uncoupling of oxidative phosphorylation is :
 - a) Insulin
 - b) Thyroxine
 - c) Epinephrine
 - d) All of the above
14. The principal anion of ECF is :
 - a) Chloride
 - b) Bicarbonate
 - c) Protein
 - d) Phosphates

15. Total $p\text{CO}_2$ is increased in :
 a) Respiratory acidosis b) Metabolic alkalosis
 c) Metabolic acidosis d) Respiratory alkalosis
16. Proteinuria is defined as :
 a) ≥ 50 mg/day protein in urine
 b) ≥ 100 mg/day protein in urine
 c) ≥ 150 mg/day protein in urine
 d) ≥ 200 mg/day protein in urine
17. Parameter(s) assessed to test the synthetic function of liver :
 a) Prothrombin b) Ceruloplasmin
 c) α_1 -Antitrypsin d) All of the above
18. The RDA for proteins is :
 a) 15 - 25gm/Kg/day b) 0.75 - 0.8 gm/Kg/day
 c) 0.2 - 0.4 gm/Kg/day d) 5 - 10 gm/Kg/day
19. Cytochrome P450 is involved in detoxification by :
 a) Hydrolysis b) Oxidation
 c) Conjugation d) Reduction
20. The following are the characteristics of free radicals, EXCEPT :
 a) Highly reactive
 b) Short half-life
 c) Cytotoxic
 d) Not produced during normal metabolism

Section - B

40 Marks

Instructions for section B and C :

- (1) Use blue/black ball point pen only.
- (2) The numbers to the right indicates full marks.
- (3) Draw diagrams wherever necessary.

Q. 2. Long Answer Questions. (ANY TWO) (2 × 10 = 20)

- A. Discuss source, RDA, metabolism (absorption, transport, and storage) and functions of Iron. Add a note on various anemias related to iron deficiency and overload. (1 + 1 + 3 + 2 + 3 = 10)

- B. Explain beta-oxidation of 16 carbon atom saturated fatty acid. How it is regulated? Explain how many ATPs are synthesized? (6 + 2 + 2)
- C. Define glycogenesis and glycogenolysis. Write the reactions of glycogenesis and glycogenolysis in liver, Add a note on Glycogen storage disorders. (2 + 5 + 3)

Q. 3. Write Brief Answer / Justifications / Biochemical basis. (ANY TEN)
(10 × 2 = 20)

- Glucose is required for the absorption of Na⁺.
- Muscle glycogen cannot contribute to blood glucose level.
- Respiratory Distress Syndrome (RDS) is observed in premature babies.
- HDL cholesterol is good cholesterol.
- In uncontrolled diabetes mellitus cataract is developed at early age
- Aspirin is used as anti-inflammatory drug.
- Brain cannot utilise fatty acid for energy purpose.
- Inhibitors of ETC?
- Why there is oedema in protein malnutrition?
- Blood is collected in fluoride bulb for estimation of blood glucose level.
- Examples of ketone bodies and functions (any two).

Section - C

40 Marks

Q. 4. Short answer questions. (ANY FOUR) (4 × 5 = 20)

- Renal Function Test.
- Outline doctor patient communication. Add a short answer on components of communication in medical encounters.
- Protein Energy Malnutrition (PEM).
- Detoxification reactions.
- Complications of Diabetes mellitus.

Q. 5.

Clinical cases. (All compulsory)**(10 × 2 = 20)****Case - 1:**

A 65 year old man was brought to the hospital in a semiconscious state. The patient displayed a typical hyperventilatory breathing pattern with fruity smell in his breath. The pulse was feeble and hypotension was noted. The laboratory reports were ordered and were as below:

pH: 7.10, $p\text{CO}_2$ 39.0 mm of Hg, HCO_3^- : 14.0 mmol /L,
 Serum Na^+ : 135.5 mmol /L, K^+ : 6.5mmol/L, Cl^- : 90mmol/L,
 Random Blood Sugar : 451 mg/dl.

- 1) Identify the acid base disorder in above case with justification?
- 2) Calculate Anion Gap. Give any 2 causes of High Anion Gap Metabolic Acidosis.
- 3) Give biochemical basis of 'fruity smell' in this patient.
- 4) Explain the basis of hyperkalemia in this case.
- 5) Mention normal serum values for pH & blood gases.

Case - 2:

A 40-year man consulted an ophthalmologist to obtain a prescription for reading glasses. The ophthalmologist noticed that the patient had bilateral arcus senilis and recommended to consult physician. Physician noticed that he also had tendon xanthomata arising from Achilli's tendons. Family history revealed his father had died of heart attack at the age of 40. An ECG taken at rest was normal but ischemic changes developed on exercise. Analysis of fasting blood for lipids showed the following :

Parameter	Patient's results	Normal range
Total cholesterol	530 mg/dL	< 200 mg/dl
Serum triglycerides	110mg/dL	< 150 mg/dl
LDL cholesterol	440 mg/dL	< 130 mg/dl
HDL cholesterol	64 mg/dL	> 60 mg/dl

1. This patient is suffering from which type of hyperlipidemia?
2. What is the possible cause of this condition?
3. Justify- LDL is termed as bad cholesterol.
4. What are the apo proteins? Mentions its functions.
5. Write down the important functions of cholesterol.



RAN - 2006000101030002

RAN-2006000101030002**1st MBBS (Biochemistry) Examination November - 2023****Biochemistry : Paper - II****Set - 2****Time: 3 Hours]****[Total Marks: 100****સૂચના : / Instructions**

- (1) નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the details of signs on your answer book

Name of the Examination:

1st MBBS (Biochemistry)

Name of the Subject :

Biochemistry : Paper - II - Set - 2

Subject Code No.: 2006000101030002

Seat No.:

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Student's Signature

- (2) All questions are compulsory.
(3) Each MCQ has only one correct answer.
(4) One mark for correct answer. No negative marking.

Section - A : MCQ**20 Marks**

- Gout is characterized by increased plasma levels of
 - Urea
 - Uric acid
 - Creatine
 - Creatinine
- Lesch-Nyhan syndrome, the sex linked recessive disorder is due to the lack of the enzyme :
 - Hypoxanthine-guanine phosphoribosyl transferase
 - Xanthine oxidase
 - Adenine phosphoribosyl transferase
 - Adenosine deaminase
- Which of the following vitamins act as a strong reducing agent?
 - Folic acid
 - Tocopherol
 - Ascorbic acid
 - Pantothenic acid

4. The anti egg white injury factor is:
 - a. Avidin
 - b. Choline
 - c. Biotin
 - d. Isoniazid
5. Immunoglobulin present in body secretion is:
 - a. Ig M
 - b. Ig D
 - c. Ig E
 - d. Ig A
6. The number of amino acids in antidiuretic hormone is
 - a. 9
 - b. 18
 - c. 27
 - d. 36
7. A non-functional plasma enzyme is
 - a. Pseudocholinesterase
 - b. Lipoprotein lipase
 - c. Proenzyme of blood coagulation
 - d. Alanine Transaminase
8. In competitive enzyme inhibition :
 - a. The structure of inhibitor generally resembles that of the substrate
 - b. Inhibitor decreases apparent K_m
 - c. K_m remains unaffected
 - d. Inhibitor decreases V_{max} without affecting K_m
9. Niacin is synthesized in the body from :
 - a. Tryptophan
 - b. Tyrosine
 - c. Glutamate
 - d. Aspartate
10. Vitamin K serves as a coenzyme in reaction that result in the modified activity of several enzymes of blood coagulation cascade. Which of the following amino acid modifications requires the activity of vitamin K?
 - a. Aspartate to β -carboxyaspartate
 - b. Glutamate to γ -carboxyglutamate
 - c. Lysine to hydroxylysine
 - d. Lysine to β -methyl lysine

11. Isoenzymes can be characterized by :
- Proteolytic enzymes activated by hydrolysis
 - Enzymes with identical primary structure
 - Similar enzymes that catalyse different reaction
 - Chemically, immunologically and electrophoretically different forms of an enzyme
12. Pyrimidine Dimers are seen in :
- Gout
 - Xeroderma pigmentosa
 - Lesch Nyhan Syndrome
 - Mutation by alkylating agents
13. The most of the ultraviolet absorption of proteins above 240 nm is due to their content of :
- Tryptophan
 - Aspartate
 - Glutamate
 - Alanine
14. Sakaguchi's reaction is specific for
- Tyrosine
 - Proline
 - Arginine
 - Cysteine
15. Magenta tongue is found in the deficiency of the vitamin :
- Riboflavin
 - Thiamine
 - Nicotinic acid
 - Pyridoxine
16. In brain, the major metabolism for removal of ammonia is the formation of
- Glutamate
 - Aspartate
 - Asparagine
 - Glutamine
17. The sparing action of methionine is :
- Tyrosine
 - Cystine
 - Arginine
 - Tryptophan
18. Which of the following plasma protein prevents loss of hemoglobin in Urine?
- Haptoglobin
 - Albumin
 - Transferrin
 - Hemopexin

19. Following are the applications of Polymerase Chain Reaction (PCR), EXCEPT :
- Prenatal diagnosis and carrier detection
 - Splicing of DNA
 - Forensic analysis of DNA samples
 - Detection of Viral and bacterial infections
20. The two nitrogens of the pyrimidine ring are contributed by
- Ammonia and glycine
 - Aspartate and carbamoyl phosphate
 - Glutamine and ammonia
 - Aspartate and ammonia

Section - B

40 Marks

Instructions for section B and C :

- Use blue/black ball point pen only.
- The numbers to the right indicates full marks.
- Draw diagrams wherever necessary

Q. 2. Long Answer Questions. (ANY TWO) (2 x 10 = 20)

- Describe the process of replication of DNA in a prokaryotic cell. What are different types of mutations? Write a note on different DNA repair mechanisms. (5 + 3 + 2)
- Describe the Catabolism of heme. Add a note on hyperbilirubinemias. (5 + 5)
- Describe primary and secondary structure of protein with example. Add a note on functions of plasma proteins. (6 + 4)

Q. 3. Write Brief Answer / Justifications / Biochemical basis. (ANY TEN) (10 x 2 = 20).

- Adenosine deaminase deficiency cause severe combined immuno-deficiency disorder.
- Mention 4 biochemical functions of Albumin
- Vitamin D Acts as a hormone. Justify.
- Biologically important peptides.
- Write down two clinical applications of ELISA
- Blue fluorescent light is used in the treatment of neonatal jaundice.

- g) Blood urea levels depletes in liver disease. Justify.
- h) Post-transcriptional modifications
- i) Telomerase inhibitors can be use in treatment of malignancy,
- j) Functions of vitamin C (any four).
- k) Zwitter ions have least buffering & amp; solubility capacity.

Section - C

40 Marks

Q. 4. Short answer questions. (ANY FOUR)

(4 × 5 = 20)

- a) Diagnostic applications of enzymes.
- b) Gout.
- c) Tumor markers.
- d) Vitamin A : Functions and Deficiency disorders.
- e) Recombinant DNA technique.

Q. 5. Clinical Cases. (ALL COMPULSORY)

(10 × 2 = 20)

Case - 1 :

A 55-year-old man attended OPD with complaints of pain in lower limbs, generalized fatigue for last 4 months. He was vegetarian by diet. His laboratory investigations showed low Vitamin B₁₂ levels, elevated Homocysteine level and normal folate level. Peripheral smear shows macrocytic anemia. Physician prescribed the vitamin B₁₂ injection and symptoms were improved.

1. Enumerate causes of vitamin B₁₂ deficiency. What is a daily requirement of vitamin B₁₂ for adult?
2. What is folate trap?
3. Why increased homocysteine level leads to cardiovascular problem?
4. Mentioned the Coenzyme form of vitamin B₁₂. Write reactions catalyzed by each of them.
5. Why vitamin B₁₂ deficiency leads to macrocytic anemia and neurological symptoms?

Case - 2 :

52 years old patient was admitted to the casualty department of hospital in a serious condition. He had become increasingly depressed after the death of his wife. His daughter found him in an unconscious state when she had come to see him in the morning. One and a half empty bottles of alcohol were found in the room. When the alcohol was examined for its contents, it was found to be containing high amount of methanol. Doctors on duty diagnosed that it was a case of methanol intoxication and decided to start treatment with ethanol.

1. Enumerate various classes of enzymes. Which class of enzymes is required to metabolize alcohols?
 2. Why methanol is toxic?
 3. Explain ethanol is used in the treatment of methanol poisoning.
 4. Enumerate salient differences between competitive and non competitive inhibition.
 5. Why in competitive inhibition K_m is increased but V_{max} is not affected?
-