P6187

RAN-25060001010125 01

RAN-25060001010125 01/2406000101010501

1st MBBS Examination September - 2026

Anatomy Paper - I

Time: 3 Hours] **[Total Marks: 100**

સૂચના : / Instructions

(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book

(2) Write each section in separate answer book.

(3) In section A, all MCQs are compulsory, only one answer will be accepted, no negative marking &must be submitted within first 30 minutes.

(4) Draw labelled diagrams wherever necessary.

(5) Figures to the right indicate marks.

Seat No.:

Student's Signature

SECTION A

Q.1. **MCQs** **1 × 20 = 20**

1. All muscles of soft palate are innervated by cranial accessory nerve EXCEPT
   a) Palatoglossus b) Palatopharyngeus
   c) Tensor veli palatini d) Levator veli palatini
2. Recurrent laryngeal nerve is related to
   a) Superior thyroid artery b) Inferior thyroid artery
   c) Superior thyroid vein d) Middle thyroid vein
3. Fascial layer overlying phrenic nerve is
   a) Prevertebral layer b) Investing layer
   c) Pretracheal layer d) None of above
4. Internal carotid nerve is branch of
   a) Superior cervical sympathetic ganglion
   b) Middle cervical sympathetic ganglion
   c) Inferior cervical sympathetic ganglion
   d) Otic ganglion
5. Expression of surprise is caused by
   a) Corrugator supercilli b) Nasalis
   c) Frontalis d) Procerus
6. The _____ of spinal nerve contains both sensory and motor fibers
   a) Anterior ramus b) Posterior ramus
   c) Main trunk d) All of above
7. Pain & thermal sensations from forehead are projected into
   a) Principal sensory nucleus of trigeminal nerve
   b) Spinal nucleus of trigeminal nerve
   c) Mesencephalic nucleus of trigeminal nerve
   d) Both a & c

8. All pass through inferior cerebellar peduncle EXCEPT
   a) Vestibulo-cerebellar tract
   b) Cerebello-vestibular tract
   c) Posterior spino-cerebellar tract
   d) Anterior spino-cerebellar tract
9. All are components of facial nerve EXCEPT
   a) Somatic efferent
   b) General visceral efferent
   c) Special visceral efferent
   c) Special visceral afferent
10. Axilla contains all EXCEPT
   a) Trunks of brachial plexus
   b) Axillary tail
   c) Intercostobrachial nerve
   c) Long thoracic nerve
11. 2nd lumbricals get innervation from
   a) Radial nerve
   b) Median nerve
   c) Ulnar nerve
   d) Musculocutaneous nerve
12. True about extensor pollicis longus
   a) Supplied by posterior interosseous nerve
   b) Inserts over distal phalanx of thumb
   c) Blood supply of anterior interosseous artery
   d) All of above
13. Rotator cuff is formed by all EXCEPT
   a) Teres minor
   b) Teres major
   c) Subscapularis
   d) Infraspinatus
14. All contribute in formation of dorsal digital expansion EXCEPT
   a) Adductor pollicis
   b) Interossei
   c) Lumbricals
   d) Extensor digitorum
15. Which of following is receptor in muscle?
   a) Motor end plate
   b) Muscle spindle
   c) Neurotransmitter
   d) Motor unit
16. Type of germinal epithelium of ovary is
   a) Simple squamous
   b) Stratified squamous
   c) Simple cuboidal
   d) Simple columnar
17. At the time of implantation, embryo is in stage of
   a) Blastocyst
   b) Zygote
   c) Foetal period
   d) Morula
18. Pituitary gland develops from
   a) Ectoderm
   b) Mesoderm
   c) Both a & b
   d) None of a & b
19. Example of pivot joint is
   a) Superior tibio-fibular joint
   b) Elbow joint
   c) Superior radio-ulnar joint
   d) Ankle joint

20. Perichondrium is absent in all EXCEPT

a) Glenoid labrum
b) Articular cartilage
c) Intervertebral disc
d) Cartilage of epiglottis

SECTION B

Q.2. Long essay question (Structured) **(10)**

Describe cavernous sinus under following headings.

a) Introduction & location
b) Structures within lateral wall
c) Communications
d) Applied aspects

Q.3. Explain Anatomical/Embryological reasons. (ANY 5) **(5 × 3 = 15)**

a) What is path of migration of motor nucleus of facial nerve during development? Explain neurological basis for such migration.
b) Enumerate extrinsic & intrinsic muscles of tongue. Which muscle is known as safety muscle of tongue? Explain anatomical basis for such nickname.
c) What is carrying angle? Explain anatomical basis for it.
d) What about deformity and position of limb in Erb's paralysis. Explain anatomical basis for it.
e) Mention relations of right and left recurrent laryngeal nerves with major arteries. Explain embryological basis for differed relations on both sides.
f) Explain embryological basis for sensory nerve supply of tongue.

Q.4. Write short notes. (ANY 3) **(3 × 5 = 15)**

a) Boundaries and contents of cubital fossa
b) Suboccipital triangle
c) Circle of Willis
d) Histology of cerebellum

SECTION C

Q.5. Applied aspects **(4 × 5 = 20)**

a) Klumpke's paralysis
b) Applied anatomy of scalp
c) Lower motor neuron paralysis
d) Development of thyroid gland with applied aspects

Q.6. Write short notes. **(4 × 5 = 20)**

a) Fibrous joints
b) Implantation
c) Histology of hyaline cartilage
d) The cadaver as our first teacher

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RAN-2506000101012502

RAN-2506000101012502/2406000101010502

1st MBBS Examination September - 2026

Anatomy Paper - II

Time: 3 Hours] **[Total Marks: 100**

સૂચના : / Instructions

(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
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(4) Draw labelled diagrams wherever necessary.

(5) Figures to the right indicate marks.

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SECTION A

Q.1. MCQs **1 × 20 =20**

1. Vertebral level of origin of coeliac trunk is
   a) LI b) L2
   c) L3 d) None of above
2. Which of following is not the boundary of Hesselbach's triangle?
   a) Inferior epigastric artery b) Lateral border of rectus abdominis
   c) External iliac artery d) Inguinal ligament
3. Inferior suprarenal artery arises from
   a) Renal artery b) Inferior phrenic artery
   c) Middle suprarenal artery d) Superior phrenic artery
4. Testicular lymphatics drain into
   a) Superficial inguinal nodes b) Deep inguinal nodes
   c) Pre-aortic &Para-aortic nodes d) None of above
5. Content/s of Calot's triangle is/are
   a) Cystic artery b) Cystic duct
   c) Cystic lymph node d) Both a &c
6. All are contents of superior mediastinum EXCEPT
   a) Ascending aorta b) Left brachiocephalic vein
   c) Trachea d) Vagus nerves
7. Pleural sac extends beyond thoracic cage at following sites EXCEPT
   a) Left costo-vertebral angle b) Left costo-xiphoid angle
   c) Right costo-vertebral angle d) Right costo-xiphoid angle

8. Adult cardiac chamber with thickest wall is
   a) Left atrium
   b) Left ventricle
   c) Right atrium
   d) Right ventricle

9. Azygous vein drains intro
   a) Right 3rd posterior intercostal vein
   b) Inferior vena cava
   c) Coronary sinus
   d) None of above

10. Muscle flexing hip and extending knee is
   a) Adductor magnus
   b) Rectus femoris
   c) Sartorius
   d) Both b & c

11 All are contents of adductor canal EXCEPT
   a) Nerve to vastus lateralis
   b) Femoral vein
   c) Saphenous nerve
   d) Anterior division of obturator nerve

12. Incorrect about peroneus longus is
   a) Evertor of foot
   b) Helps in maintenance of transverse arch
   c) Inserts on 5th metatarsal bone
   d) Innervated by superficial peroneal nerve

13. Spring ligament connects
   a) Talus and navicular
   b) Calcaneum and cuboid
   c) Talus and cuboid
   d) Calcaneum and navicular

14. Lateral plantar nerve innervates all EXCEPT
   a) Flexor digiti minimi brevis
   b) Adductor hallucis
   c) Flexor digitorum brevis
   d) 2nd lumbrical

15. Space of Mall are found in
   a) Pancreas
   b) Kidney
   c) Liver
   d) Bone

16. Stereocilia are located in
   a) Inner ear
   b) Trachea
   c) Fallopian tube
   d) Both b & c

17. Which lumbar intersegmental artery does give rise to axis artery of lower limb?
   a) 2nd
   b) 3rd
   c) 4th
   d) 5th

18. Somites are developed from
   a) Paraxial mesoderm
   b) Intermediate mesoderm
   c) Lateral plate mesoderm
   d) Endoderm

19. Factor/s helping in venous return is/are
   a) Gravitation in case of upper part of body
   b) Muscular contraction
   c) Negative intrathoracic pressure
   d) All of above

20. Genotype of Klinefelter syndrome is

a) Trisomy 21
b) 47, XXY
c) 45,XO
d) None of above

SECTION B

Q.2. **Long essay question (Structured)** **(10)**

Describe male urethra under following headings.

a) Introduction
b) Description of different parts
c) Neurovascular supply

Q.3. **Explain Anatomical/Embryological reasons. (ANY 5)** **(5 × 3 =15)**

a) Explain anatomical basis for medicolegal importance of femur ossification.
b) What is paracentesis thoracic? What is its preferred site? What is anatomical basis for such preference.
c) Which are three important cardinal features of colon? Explain anatomical basis for formation of colonic haustrations.
d) Which muscle is known as peripheral heart. Explain anatomical basis for such nickname.
e) Which cardiac atrial pressure is higher during foetal life? Explain embryological basis for it.
f) What is root value of nerve supplying motor fibres to thoracoabdominal diaphragm? Explain embryological basis for such vast difference between level of root value and level of target muscle.

Q.4. **Write short notes. (ANY 3)** **(3 × 5 = 15)**

a) Femoral triangle
b) Superior mesenteric artery
c) Thoracic duct
d) Histology of duodenum

SECTION C

Q.5. **Applied aspects** **(4 × 5 = 20)**

a) Applied anatomy of knee joint
b) Mediastinal syndrome
c) Portal hypertension
d) Ventricular septal defects

Q.6. **Write short notes.** **(4 × 5 = 20)**

a) X-linked recessive inheritance OR Down's syndrome

b) Paramesonephric ducts

c) Histology of ileum

d) Barriers to communication

RAN-25060001010226 01

RAN-25060001010226 01/2406000101020601

Fy. M.B.B.S Examination September - 2026

Physiology (Paper : I) Set-3

Time: 3 Hours] **[Total Marks: 100**

સૂચના : / Instructions

(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book
(2) All questions are compulsory except where choice is given.
(3) Select single most appropriate answer for MCQs. NO NEGATIVE MARKING for MCQs.
(4) Write legibly and to the point.
(5) Draw diagrams and flow charts wherever necessary.

Seat No.:

Student's Signature

Section "A" Multiple choice Question I MCQ

Q.1. MCQ Based {20 MCQs} **(1 mark each)l × 20 = 20M**

1. Which of the following cells produce antibodies ?
   A) Neutrophil B) T lymphocytes
   C) Blymphocytes D) Monocytes

2. Risk of erythroblastosis fetalis will be there in which of the following conditions?
   A) Mother and fetus both Rh negative
   B) Mother and fetus both Rh positive
   C) Mother Rh negative and fetus Rh positive
   D) Mother Rh positive and fetus Rh negative

3. Gastrectomy patients need supplementation of:
   A) Vitamin A B) Vitamin B12
   C) Vitamin C D) Vitamin D

4. 30 years old male after travelling to deep forest woods experienced high grade fever and was evaluated. He was diagnosed to be having a viral fever with platelet count of 60,000 per cu.mm of blood.The laboratory investigation will show :
   A) Normal Bleeding time and Normal Clotting time
   B) Normal Bleeding time and Prolonged Clotting time
   C) Prolonged Bleeding time and Prolonged Clotting time
   D) Prolonged Bleeding time and Normal Clotting time

5. Surfactant lining the alveolar membrane is responsible for:
   A) Preventing alveolar collapse
   B) Less work done during breathing
   C) Preventing pulmonary edema
   D) All of the above

6. Volume of air inspired or expired in each breath in normal respiration is called :
   A) Residual volume
   B) Tidal volume
   C) Inspiratory Reserve volume
   D) Expiratory Reserve volume

7. Values of FEV 1 = 1.3L and FVC = 3.9L signify which of the following clinical conditions?
   A) Normal lung function
   B) Obstructive lung disease
   C) Restrictive lung disease
   D) Both Band C

8. O_2 therapy is not useful in :
   A) Hypoxic hypoxia
   B) Stagnant hypoxia
   C) Histotoxic hypoxia
   D) Anemic hypoxia

9. According to Marey's law :
   A) Heart rate is inversely proportional to blood pressure .
   B) Blood pressure is inversely proportional to Respiratory rate.
   C) Myocardial contraction is directly proportional to venous return
   D) Heart rate is directly proportional to intracranial pressure.

10. Normal mean QRS vector in ECG is :
   A) -59 degrees
   B) zero degrees
   C) +59 degrees
   D) +129 degrees

11. Plateau phase of cardiac action potential is mainly caused by:
   A) Slow K+ influx
   B) Slow Ca +2 influx
   C) Rapid Na + influx
   D) Na + -K+ pump

12. A 74 year old man was bought to medical OPD with slow heart rate, dizzy spells and sudden fainting episodes. His ECG shows normal p wave rate, PR interval is 0.32 s and failure of some p waves to conduct to ventricles and dropped beats. What is the most likely cause?
   A) First degree Heart Block
   B) Second degree Mobitz type I heart block
   C) Second degree Mobitz type II heart block
   D) Third degree Heart Block

13. During moderate exercise which of the following is observed ?
   A) Increase in both systolic and Diastolic BP
   B) Increase in SBP and decrease in pulse pressure
   C) Decrease in Diastolic BP
   D) Increase in SBP, no change in DBP and increase in pulse pressure

14. Achalasia cardia is a condition that represents a state of:
   A) Failure of opening of Lower esophageal sphincter
   B) Regurgitation of food from stomach
   C) Failure of opening of pyloric sphincter
   D) Failure of opening of ileocecal valve

15. What abnormality is there in sickle cell anemia?
    A) Valine is replaced byglutamic acid at 6th position of alpha chain of hemoglobin.
    B) Valine is replaced byglutamic acid at 6th position of beta chain of hemoglobin.
    C) Glutamic acid is replaced by valine at 6th position of alpha chain of hemoglobin.
    D) Glutamic acid is replaced by valine at 6th position of beta chain of hemoglobin.

16. Which of the following can result in gastric ulcer by damaging the mucosal barrier and increasing acid secretion?
    A) Oily food
    B) H. Pylori
    C) Bile salts
    D) Epidermal growth factor

17. Inulin clearance closely resembles to :
    A) GFR
    B) Renal plasma flow
    C) Renal tubular secretion
    D) Renal blood flow

18. Type I muscle fibers found more in Marathon runners are :
    A) Fast twitch
    B) Red
    C) White
    D) Glycolytic

19. Syncytial nature of the cardiac muscle is due to:
    A) Tight junction
    B) Gap junction
    C) Zonula occludens
    D) Fascia adherence

20. Normal GFR of a healthy person is :
    A) 1200 ml/mi
    B) 655 ml/min
    C) 300 ml/min
    D) 125 ml/min

Section "B" **(40 Marks)**

Q.2. Define cardiac output, stroke volume and cardiac index with their normal values. How cardiac output is regulated in health? How it is measured using Fick's principle?
(3+5+2=10 M)

Q.3. **Short Notes - Reasoning type (5 out of 6)** **(3 mark each) 5 × 3 =15M**
a) Differentiate between isotonic and isometric muscle contraction with examples.
b) Why Polycythemia occurs at high altitude?
c) Why Cardiac muscle does not get fatigued and tetanized?
d) Why Plasma proteins are usually not filtered through glomerular membrane?
e) Why Oxygen Hemoglobin dissociation curve shift to right at tissue level?
f) Why there is increase in blood pH after meals?

Q.4. **Short notes (3 out of 4) (5 mark each)** **3 × 5 = 15 M**
a) Cell mediated immunity
b) Pernicious Anemia

c) Counter current mechanism of concentration of urine
d) Juxtaglomerular apparatus- structure and functions

Section "C"

(40 Marks)

Q.5. Short notes (4 out of 5) (5 mark each) **4 × 5 = 20 M**

a) Mechanism of skeletal Muscle contraction
b) Active transport- types and examples
c) Role of chemoreceptors in the regulation of respiration
d) Stages of Deglutition
e) Functions of Bile

Q.6. Short notes (4 out of 5) (5 mark each) **4 × 5 = 20 M**

a) Rights of patients in doctor patient relationship
b) Effects of exercise on cardiovascular system
c) Peptic Ulcer
d) Acclimatization at High Altitude
e) Micturition reflex & Abnormalities of micturition

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RAN-2506000101022602 / 2406000101020602

F. Y. MBBS Examination September - 2026

Physiology Paper - 2, SET - 1

Time: 3 Hours] **[Total Marks: 100**

સૂચના : / Instructions

(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
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Seat No.:

Student's Signature

Q. 1. **MCQs: (20 MCQs) 20 × 1 mark each** **20**

1) A 35 year old laboratory technician accidentally spilled hot water on his right hand. Which tract will carry the sensation of heat towards the brain?
   A) Dorsal column Medial lemniscal system
   B) Pyramidal Tract
   C) Anterior spinothalamic Tract
   D) Lateral spinothalamic Tract

2) A 25 year old soldier has to undergo right leg amputation surgery following a gunshot injury. After a day of surgery he started complaining of severe pain in the right great toe which is actually not there. Which of the following properties of receptor best explains this physiological phenomena?
   A) Law of adequate stimulus. B) Weber Feschner Law.
   C) Law of Projection. D) Law of Adaptation.

3) Which of the following is true of parasympathetic nervous system?
   A) Short preganglionic fiber
   B) 75%of all parasympathetic fibers are in vagus nerves
   C) Norepinephrine is the primary neurotransmitter
   D) Effector cells has alpha or beta receptors

4) Which of the following is the major site of formation of CSF ?
   A) Cisterna magna B) Lateral ventricle
   C) Third ventricle D) Fourth ventricle

5) Which is the active form of Rhodopsin that leads to phototransduction in eye when light energy hits photoreceptors in retina ?
   A) Visual purple B) Bathorhodopsin
   C) Lumirhodopsin D) Metarhodopsin II

6) Which of the following is not the function of Sertoli cells in seminiferous tubules?
   A) Providing nutrition to the developing sperm
   B) Forming blood testes barrier
   C) Secreting testosterone
   D) Secreting inhibin

7) The normal site of fertilization is:
   A) Ovary B) Fallopian Tube
   C) Uterus D) Cervix

8) The multiple changes that takes place in spermatozoa when it comes in the contact with the fluid in the female genital tract which activates spermatozoa for final process of fertilization are known as :
A) Spermiogenesis
B) Spermiation
C) Capacitation
D) Ejaculation

9) Which of the following chemicals are responsible forgiving umami taste sensation?
A) Hydrogen ions
B) Sodium ions
C) Alkaloids
D) L-Glutamate

10) Chemical thermogenesis is due to:
A) Presence of brown fat
B) Decreased thyroxine
C) Shivering
D) Piloerection

11) Which of the following blood parameters increases with increased physical activity?
A) HDL cholesterol
B) LDL cholesterol
C) Triglyceride
D) Glucose

12) A patient having an enlarged thyroid gland was found to have high levels of both TSH and TRH with tachycardia. What is the most likely condition?
A) Endemic goiter
B) Hypothalamic tumor secreting large amount of TRH
C) Pituitary tumor secreting large amount of TSH
D) Grave's disease

13) Trousseau's sign and Chvostek's sign are seen in patients of:
A) Hypoparathyroidism
B) Hyperparathyroidism
C) Hypothyroidism
D) Addison's disease

14) Which hormone is responsible for maintaining Corpus luteum of pregnancy during early pregnancy?
A) Human Chorionic Gonadotropin
B) Human Chorionic Somatomammotropin
C) Estrogen
D) Relaxin

15) Excess aldosterone is associated with:
A) Hyperkalemia
B) Hyponatremia
C) Alkalosis
D) Acidosis

16) Which of the following neuroglial cells help in forming blood brain barrier?
A) Microglia
B) Astrocytes
C) Schwann cells
D) Oligodendrocytes

17) Endocochlear Potential is :
A) –150mv
B) –70mv
C) + 80mv
D) +150mv

18) Which of the following cell structures is involved in chromatolysis during Wallerian degeneration of nerve?
A) Axon cylinder
B) Myelin sheath
C) Node of Ranvier
D) Rough endoplasmic reticulum

19) Receptors and site of action of Antidiuretic Hormone for reabsorption of water from kidneys are:
A) V1 receptors at afferent arteriole
B) V2 receptors at efferent arteriole
C) V1 receptors at PCT and loop of Henle
D) V2 receptors at collecting ducts and tubules

20) Golgi tendon organ controlling muscle tension is innervated by which of the following nerve fibers?
A) la
B) lb
C) ll
D) y

Section -B (40M)

Q. 2. Using a flowchart explain the transmission of impulse across a chemical synapse. Enlist the various properties of synapse and explain any six of them citing examples. Enumerate any one excitatory and one inhibitory neurotransmitter. **(3+6+1=10M)**

Q. 3. **Short notes: Explain Why? (Reasoning type - Any 5 out of 6)** **(3×5=15M)**

A) Aching and cramping pain is often felt around umbilicus in acute appendicitis even though appendix is situated in right iliac fossa.
B) Oral contraceptive pills are commonly used by females to prevent pregnancy.
C) Lactational amenorrhoea is seen in lactating mothers for a few months after delivery.
D) An ageing person is unable to focus nearby objects and require glasses to read newspaper.
E) Polyuria and polydipsia are classical symptoms of Diabetes Mellitus.
F) Glucocorticoids are widely used as anti-inflammatory agent.

Q. 4. **Write short notes on: (Any 3 out of 4)** **(3×5=15M)**

A) Parkinson's disease- clinical features and physiological basis of treatment.
B) Functions of Hypothalamus.
C) Taste buds- structure, location and functions.
D) Organ of Corti.

Section -C

Q. 5. **Write short notes on: (Any 4 out of 5)** **(4× 5=20M)**

A) Cretenism.
B) Functions of oxytocin.
C) Fight or Flight Response.
D) Menstrual cycle- endometrial changes and hormonal regulation.
E) Puberty.

Q. 6. **Write short notes on: (Any 4 out of 5)** **(4×5=20 M)**

A) Mechanisms of heat loss for temperature regulation.
B) Visual pathway and its lesions.
C) Types of Doctor patient relationships.
D) Types of Aphasia.
E) Acromegaly.

RAN-2506000101032701

RAN-2506000101032701 / 2406000101030701

1st MBBS Theory Examination September - 2026

Biochemistry Paper - I

સૂચના : / Instructions

(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
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Section A:

Q.1. Multiple Choice Questions **(20 × 1=20)**

1) All the following are phase I reaction, except
   A) Hydrolysis B) Conjugation
   C) Reduction D) Hydroxylation

2) Bronze diabetes is associated with
   A) Wilson's disease B) Hemosiderosis
   C) Hemochromatosis D) Iron deficiency anemia

3) One of the following disease is due to accumulation of mucopolysaccharides
   A) Hunter's syndrome B) Sanfilippo syndrome
   C) Hurler's syndrome D) All the above

4) Features of galactosemia include following except:
   A) Cataract B) Mental Retardation
   C) Hemolytic Anemia D) Heptaomegaly

5) The following substance is used to reduce intracranial pressure:
   A) Sorbitol B) Dulcitol
   C) Ribitol D) Mannitol

6) A child presents with exercise intolerance and chronic hemolytic anemia. Which glycolytic enzyme deficiency is the most likely cause?
   A) Glucokinase B) Phosphofructokinase
   C) Pyruvate Kinase D) Aldolase A

7) Which of the following is correct?
   A) Tay Sach's: α galactosidase B) Gaucher: Ceramidase
   C) Niemann Pick: Sphingomyelinase D) Fabry's : Arylsulphatase A

8) After 48 hours of fasting which of the following will not be active?
   A) Lipolysis B) Ketone Body Synthesis
   C) Gluconeogenesis D) Glycogenolysis

9) An infant born at 28 weeks gestation rapidly gave evidence of respiratory distress syndrome. Which of the following statement is true?
   A) Concentration of dipalmitoyl phosphatidylcholine is expected to be lower than that of a full term baby.
   B) Consequence of few type II pneumocytes
   C) Case unrelated to premature death
   D) L/S ratio is >2

10) Glycemic Index is highest for:
A) Fructose
B) Sucrose
C) Starch
D) Glucose

11) Absence of peroxisomes in tissues result in
A) Refsum's disease
B) SIDS
C) Zellweger syndrome
D) Methylmalonic acidemia

12) Calcium absorption is increased by :
A) Vitamin K
B) Vitamin Bl2
C) Vitamin D
D) Vitamin Bl

13) Vitamin acts as coenzyme for the carboxylation reactions is:
A) Pantothenic acid
B) Niacin
C) Thiamine
D) Biotin

14) Following is the omega-3 fatty acid
A) Linolenic acid
B) Linoleic acid
C) Oleic acid
D) Arachidonic acid

15) Clathrin protein is associated with:
A) IDL
B) VLDL
C) LDL
D) HDL

16) Severe thiamine deficiency is associated with:
A) Decreased RBC transketolase activity
B) Increased clotting time
C) Decreased RBC transaminase activity
D) Increased xanthic acid excretion

17) 2,3-BPG is formed during _____ pathway in _____ cells
A) Kreb's cycle, pletelets
B) Glycolysis, white blood
C) Glycolysis, lymphocytes
D) Glycolysis, red blood

I8) Valinomycin inhibits oxidative phosphorylation, because:
A) It makes mitochondrial permeable to potassium
B) It inhibits cytochrome oxidase
C) It forms a complex with NADH
D) It inhibits ATP Synthase

19) If the product is more toxic than original compound, which of the following terms is called?
A) Conjucation
B) Detoxification
C) Biotransformation
D) Bioactivation

20) Liver glycogen is used in fasting to provide glucose. Muscle glycogen is not. What is the explanation for this?
A) Muscle does not have a debranching enzyme
B) Muscle cannot degrade glycogen further than glucose-1-phosphate
C) Muscle lacks gIucose-6-phosphatase
D) The liver provides all the glucose necessary for metabolism and there is no need for muscle to do the same

Section B:

Q-2. Long answer questions (Any 1 out of 2) **(10 × 1= 10)**

1. Describe Glycogen metabolism (Glycogenesis and Glycogenolysis) in detail with reactions, energetic, regulation and significance. **(5+2+2+1)**

OR

2. Describe the metabolism (absorption, transport and homeostasis) of Calcium in the body. Add a note on the disorders related to calcium metabolism. **(6+4)**

Q-3. **Short answer questions/Justification/Biochemical Basis (Any 5 out of 6)** **(3 × 5 =15)**

a. Odd chain fatty acids can provide substrate for gluconeogenesis.
b. Vitamin E is a free radical scavenger.
c. Heparin is known as clearing factor.
d. Omega-3 fatty acids are good for health.
e. Vegans are prone for myocardial infarction.
f. Diarrhoea causes normal anion gap acidosis.

Q-4. **Short Notes (Any 3 out of 4)** **(3 × 5 = 15)**

a. Glucose Transporters
b. Metabolic adaptations during fasting
c. Effect of starvation on carbohydrate and lipid metabolism in liver.
d. Significance of free radical scavanging system.

Section C:

Q-5. **Short Notes (All Compulsory)** **(4 × 5=20)**

a. A 67 yrs old man was brought to the hospital in a semiconscious state. There was fruity smell in his breadth and displayed a typical hyper ventilatory breathing pattern. Pulse was feeble and hypotension was noted. The laboratory reports were ordered and were as follows : pH: 7.24 , pCo2: 38.0 mm Hg (35-45 mm of Hg), HCO3-: 17.0 mmol/L(22-26 mmol/L),Na+: 135 mmol/L (135-145 mmol/L), K+: 6.4 mmol/L (3.5- 5.5 mmol/L), CI- 93 mmol/L (96-106 mmol/L), RBS: 487 mg/dl.

1. What acid base disorder would you expect based on this information? Justify. **(2)**
2. Calculate anion gap and write its normal range. **(1)**
3. Give the biochemical basis of fruity smell in this patient. **(1)**
4. Explain the basis of hyperkalemia in this case. **(1)**

b. HBAlc with its significance
c. Fredrickson's Classification of Hyperlipoprotinaemias
d. A 45-year-old male patient reported in OPD with history of knee joint pain. On examination, physician also noticed tremors in his hands. USG of Abdomen shows hepatocellular degeneration. Slit lamp examination of eyes revealed presence of Kayser-Fleischer ring. Blood investigation revealed reduced blood ceruloplasmin levels and increased copper excretion in urine.

1. What is the probable diagnosis? Justify **(2)**
2. Write any four enzymes where copper acts as cofactor. **(2)**
3. Write down the dietary sources of copper. **(1)**

Q-6. **Short Notes (All Compulsory)** **(4 × 5 = 20)**

a. Describe essential elements of communication in medical encounters.
b. Prostaglandins: Types and Clinical significance.
c. Phase-II reactions of Detoxification with examples
d. Inhibitors of Electron Transport Chain

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1st MBBS Theory Examination September - 2026

Biochemistry Paper - II

Time: 3 Hours] **[Total Marks: 100**

સૂચના : / Instructions

(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book

Seat No.:

Student's Signature

Section A

Q.1. Multiple Choice Questions **(20 × 1=20)**

1) Which plasma protein is mainly responsible for maintaining oncotic pressure?
   A) Globulin B) Fibrinogen
   C) Albumin D) Prothrombin

2) Which of the following scenarios with a diagnosis of chronic liver disease?
   A) Decreased Albumin, Normal PT
   B) Decreased Albumin, Increased PT
   C) Normal Albumin. Increased PT
   D) Increased Albumin, Normal PT

3) A 67-year-old man presented to the emergency department with a 1 week history of angina and shortness of breath. He complained that his face and extremities had a "blue color." His medical history included chronic stable angina treated with isosorbide dinitrate and nitroglycerin. Blood obtained for analysis was chocolate-colored. Which one of the following is the most likely diagnosis?
   A) Sickle cell anemia B) Carboxyhemoglobinemia
   C) Methemoglobinemia D) β-Thalassemia

4) A patient present with jaundice, abdominal pain and nausea. Lab report shows: increased plasma conjugated bilirubin, urinary bilirubin present & urinary urobilinogen absent. What is the cause of jaundice?
   A) Decreased hepatic conjugation of bilirubin
   B) Decreased secretion of bile into intestine
   C) Decreased hepatic uptake of bilirubin
   D) Increased hemolysis

5) Tumor markers for ovarian cancer are
   A) Beta-hcG B) AFP
   C) CA-125 D) CEA

6) The following compound is not a polyamine
   A) Ethanolamine B) Spermine
   C) Putrescine D) Spermidine

7) UGA is stop codon in cytoplasma, whereas in mitochondria it codes for
   A) Isoleusine B) Tryptophan
   C) Methionine D) Arginine

8) The ratio between the distance travelled by substance and the distance travelled by a solvent front is known as
A) Rf value
B) Rs value
C) pI point
D) None of the above

9) Hormone - receptor complex binds to DNA at
A) Promoter element
B) CAAT box
C) HRE (Hormone Response Elements)
D) TATA box

10) 33 year old women presented with abdominal pain & behavioral symptoms. She developed autonomic instability and respiratory failure. On examination, there was loss of sensory and motor responses with no history of photo sensitivity. Lab findings were increased urinary porphobilinogen levels and ALA. She was diagnosed with Acute intermittent porphyria. Which enzyme is deficient?
A) Uroporphyrinogen III synthase
B) ALA synthase
C) ALA dehydratase
D) Hydroxymethylbilane synthase

11) All the following proteins are associated with only eukaryotic replication except
A) Replication protein A
B) Replication factor C
C) Proliferating cell nuclear antigen
D) Single stranded binding proteins

12) The region -10 bp (upstream) to the transcription initation site in bacterial cells is called
A) Pribnow box
B) CAAT box
C) HRE
D) Hogness box

13) Organophosphorus poisoning diagnosis depends on:
A) Estimation of cholinestrase
B) Estimation of Mercury
C) Estimation of choline
D) Estimation of acetylcholinesterase

14) All statements regarding Gamma globulins are correct except
A) Synthesized by hepatocytes
B) Synthesized by immune cells
C) Forms antibodies
D) Immunoglobulins

15) The enzyme that produces single stranded nicks in DNA
A) DNA Polymerase I
B) DNAase I
C) DNA ligase
D) Polynucleotide kinase

16) Which is true regarding amino acids?
A) Alanine is ketogenic
B) Glycine is ketogenic
C) Branched chain amino acids are catabolized primarily in the liver
D) Cysteine is essential for individuals consuming diet deficient in methionine

17) Which of the following enzymes are used as a markers of hepatocellular injury
A) ALP & GGT
B) ALT & AST
C) LDH & CK
D) Both A & B

18) Which of the following pairs correctly matches a biogenic amine with its precursor amino acid?
A) Melatonin-Tryptophan
B) GABA-Tyrosine
C) Histamine - Glutamate
D) Norepinephrine-Tryptophan

19) Which of the following molecules links the Urea Cycle to the Tricarboxylic Acid (TCA) Cycle?
A) Oxaloacetate
B) Succinyl-CoA
C) Fumarate
D) Acetyl-CoAs

20) Which one of the following enzymes of nucleotide metabolism is correctly paired with its pharmacologic inhibitor?
A) Thymidylate synthase - allopurinol
B) Xanthine oxidase - probenecid
C) Ribonucleotide reductase - 5-Fluorouracil
D) Dihydrofolate reductase - methotrexate

Section B

Q-2. **Long answer questions (Any 1 out of 2)** **(10 × 1 = 10)**

Explain the formation and fate of Ammonia in detail with disorders. **(6+4)**

OR

Describe coenzymes and isoenzymes with examples. Write diagnostic and therapeutic applications of enzymes. **(2+2+6)**

Q-3. **Short answer questions/Justification/Biochemical Basis (Any 5 out of 6)** **(3 × 5 = 15)**

a. Name any three multi-enzyme complexes.
b. Name any two diseases cured by Gene Therapy.
c. Transamination and deamination.
d. G-protein coupled receptors form second messenger system.
e. Nucleotide analogues are important anticancer drugs.
f. What is Levey-Jennings chart? Explain.

Q-4. **Short Notes (Any 3 out of 4)** **(3 × 5 = 15)**

a. Biologically important nucleotides
b. Applications of Recombinant DNA Technology
c. Urea cycle disorders
d. Post translational modifications

Section C

Q-5. **Short Notes (All Compulsory)** **(4 × 5 =20)**

a. A 2-month-old male infant was brought to the pediatric outpatient department by his parents because of very light skin, white hair, and light-colored eyebrows and eyelashes since birth. The parents also noticed that the baby was sensitive to bright light and had rapid involuntary eye movements (nystagmus). On examination, the infant had marked hypopigmentation of the skin, hair, and iris, with reduced visual acuity. There were no abnormalities of other organs, and the baby's growth and development were normal. The family history revealed that the paternal grandfather had similar features.

1. What is the probable diagnosis? Justify **(1)**
2. Explain the biochemical basis of generalized hypopigmentation and photophobia? **(2)**
3. Explain the biochemical pathway for melanin synthesis **(2)**

b. Alkaptonuria
c. Gout
d. A 10-year-old boy from a tribal village was brought to the Department of Pediatrics with a history of jaundice, normocytic anemia, and recurrent episodes of acute bone pain. On investigation, he was found to have a low hemoglobin level (6.5 g/dL). A peripheral blood smear revealed numerous sickle cells, and he was diagnosed with sickle cell anemia.

1. Explain the biochemical basis of this case. **(2)**
2. Which are the investigations used to diagnose this condition? **(1)**
3. Write a note on different types of hemoglobin variants. **(2)**

Q-6. **Short Notes (All Compulsory)** **(4 × 5 = 20)**

a. Role of a physician to society and community
b. Oncogenes and Tumor Suppressor Genes
c. Classify mutations with examples
d. Principle and steps of PCR.