



RAN - 2006000101020001

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1st MBBS Examination November - 2023

Physiology : Paper - I

Set - 3

Time: 3 Hours]

[Total Marks: 100

सूचना : / Instructions

(1)

नीचे दृशविले निशानीवाणी विगतो उत्तरवही पर अवश्य लभवी.
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

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- 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
- A. It is located in the submucosa of hollow organs of the alimentary canal
 - B. It helps to maintain movements of the gastrointestinal tract
 - C. It's function is mediated by nitric oxide
 - D. Its function is mediated by acetylcholine
- 7) Adherens junctions are specialized cell junctions that formed by linking, the _____ to transmembrane proteins known as _____.
- A. microtubule cytoskeleton ... cadherins
 - B. microtubule cytoskeleton ... integrins
 - C. intermediate filament cytoskeleton ... integrins
 - D. actin cytoskeleton ... cadherin
- 8) The motor unit is :
- A. Muscle fibre and neurons supplying it
 - B. Ventral horn cells along with its motor nerve
 - C. Single motor neuron and all the muscle fibres it supplies
 - D. 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 :
- A. Chemotaxis - Diapedesis - Opsonization - Phagocytosis
 - B. Diapedesis - Opsonization - Chemotaxis - Phagocytosis
 - C. Diapedesis - Chemotaxis - Opsonization - Phagocytosis
 - D. Phagocytosis - Diapedesis - Chemotaxis - Opsonization
- 11) Cardiovascular changes that occur during inspiration include :
- A. Decreased heart rate
 - B. Decreased right ventricular filling
 - C. Decreased right ventricular output
 - D. Increased blood returning to the heart

- 12) Which of the following is **NOT TRUE** regarding von Willebrand's factor?
- A. Regulates circulating level of factor VIII
 - B. Produced by endothelial cell
 - C. Prevents adhesion of platelets with collagen
 - D. 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
- A. $\text{Na}^+ - \text{K}^+$ pump
 - B. $\text{Na}^+ - \text{Cl}^-$ symporter
 - C. $\text{Na}^+ - \text{K}^+ - 2\text{Cl}^-$ cotransporter
 - D. $\text{Na}^+ - \text{H}^+$ antiporter
- 14) Creatinine is **not ideal** to measure GFR in humans because?
- A. It is toxic
 - B. Some of it is secreted by tubules
 - C. Not freely filtered
 - D. 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?
- A. Decreased firing of carotid sinus baroreceptors
 - B. Increased sympathetic activity to the ventricles
 - C. Increased parasympathetic activity to the SA Node
 - D. Increased parasympathetic activity to the arterioles of skeletal muscles and skin
- 17) Venous Return :
- A. Increases on standing
 - B. Decreases by deep inspiration
 - C. Decreases by venoconstriction
 - D. When increased, activates Bainbridge reflex

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

- I. What type of lung disorder is the man suffering from? (1 mark)
- II. Describe the structural changes in his respiratory system and their physiological basis. (3 marks)
- III. What is the likely cause of neck vein distention and pitting edema in legs? (2 marks)
- IV. 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)**
- Rh blood group
 - Facilitated diffusion
 - Juxtamedullary nephron
 - Hypovolemic shock
 - Doctor patient relationship
 - Stokes-Adams syndrome

- Q. 3. Short notes. (Any 3 out of 4) (3 × 5 = 15 marks)**
- Heart sounds
 - Mismatched blood transfusion
 - Gastric emptying
 - 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)**
- Compare and contrast: Isotonic contraction and Isometric contraction
 - Classification of Hypoxia
 - C. Principles for treatment of peptic ulcer
 - GFR
 - Bainbridge reflex
 - Functions of plasma protein

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



RAN - 2006000101020002

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First MBBS Examination November - 2023

Physiology : Paper - II

Set - 2

Time: 3 Hours]

[Total Marks: 100

सूचना : / Instructions

(1)

नीचे दृशविले निशानीवाणी विगतो उत्तरवही पर अवश्य लभवी.
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

- 1) Proprioceptive sensation is lost if there is damage to :
 - a) Dorsal column
 - b) Cerebellum
 - c) Motor cortex
 - d) Basal ganglia

- 2) All are features of upper motor neuron lesion EXCEPT :
 - a) Hypertonia
 - b) Muscle wasting
 - c) Babinski's sign is positive
 - d) Large number of muscles are involved

- 3) All are characteristics of EPSP (excitatory post synaptic potential) EXCEPT :
 - a) It is a local potential
 - b) It follows all or none law
 - c) It cannot propagate
 - d) It does not have refractory period

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