

VINAYAKA MISSION'S RESEARCH FOUNDATION, SALEM  
(Deemed to be University)

FIRST MBBS DEGREE EXAMINATION – June 2021

HUMAN PHYSIOLOGY - I

SECTION A

Time: Twenty Minutes

Maximum: 20 marks

Register Number :

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Signature of the candidate

Signature of the Invigilator

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**Instructions to the candidates**

1. Write your Register Number and sign at the place specified on the first page of this Question Booklet.
2. Do not open this question booklet until Invigilator announces the commencement of the examination.
3. Answer ALL the Twenty questions. They carry equal marks. No negative marking for wrong answers.
4. Answers should be marked legibly in the SHEET provided in capital letters.
5. THE QUESTION BOOKLET SHOULD NOT BE TAKEN OUT OF THE EXAMINATION HALL.
6. Questions should not be copied and taken out of the Examination Hall. Anyone found violating this rule shall not be permitted to write the examination and shall be sent out of the Hall.
7. At the end of 20 minutes, when the Invigilator announces 'STOP WRITING' you must stop writing immediately. If the candidate tries to attempt to answer the questions after the prescribed time, their answer script becomes invalid.
8. Hand over the questions booklet containing answer sheet to the invigilator when you finish answering or immediately after 20 minutes.
9. All the questions of Section B to be answered in the main answer booklet provided.

**HUMAN PHYSIOLOGY - I**  
**SECTION-A (20X1-20 MARKS)**  
Multiple choice questions (MCQ)

Time: Twenty Minutes

Maximum: 20 marks

Select the most appropriate answer and answer in the answer sheet attached:

1. The processing of protein and formation of secretory granules is done by
  - A. Ribosomes
  - B. Centrosome
  - C. Golgi apparatus
  - D. Cytoskeleton
  
2. All are lysosomal storage disorders except
  - A. Fabry disease
  - B. Cushing's disease
  - C. Gaucher's disease
  - D. Tay - Sachs disease.
  
3. Osmotic fragility is increased in
  - A. Sickle cell anemia
  - B. Thalassemia
  - C. Hereditary spherocytosis
  - D. Iron deficiency anemia
  
4. A man falls into a deep sleep with one arm under his head. This arm is paralyzed when he awakens, but it tingles, and pain sensation in it is still intact. The reason for the loss of motor function without loss of pain sensation is that in the nerves to his arm
  - A. A fibres are more susceptible to hypoxia than B fibres.
  - B. A fibres are more sensitive to pressure than C fibres.
  - C. C fibres are more sensitive to pressure than A fibres.
  - D. Motor nerves are more affected by sleep than sensory nerves.
  
5. Disseminated intravascular coagulation (DIC) is caused due to
  - A. Decreased formation of fibrin.
  - B. Increased formation of thrombin.
  - C. Increased availability of calcium.
  - D. Decreased prothrombin activator.

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6. Rate of propagation of nerve impulse in a myelinated nerve is... times as compared to unmyelinated fibre of same diameter.
  - A. 5 - 10
  - B. 10 - 50
  - C. 50 - 100
  - D. 100 - 150
  
7. Which of the following statements about nerve growth factor is not true?
  - A. It is made up of three polypeptide subunits.
  - B. It is responsible for the growth and maintenance of adrenergic neurons in the basal forebrain and the striatum.
  - C. It is necessary for the growth and development of the sympathetic nervous system.
  - D. It is picked up by nerves from the organs they innervate.
  
8. A 47-year-old female was admitted to the hospital after reporting that she had been experiencing nausea and vomiting for about two days and then developed severe muscle weakness and neurological symptoms including ptosis and dysphagia. She indicated she had eaten at a restaurant the evening before the symptoms began. Lab tests were positive for Clostridium botulinum. Neurotoxins block the reuptake
  - A. Of neurotransmitters into presynaptic terminals.
  - B. Such as tetanus toxin binds reversibly to the presynaptic membrane at the neuromuscular junction. C. reaches the cell body of the motor neuron by diffusion into the spinal cord.
  - D. Such as botulinum toxin prevents the release of acetylcholine from motor neurons due to cleavage of either synaptosome associated proteins or vesicle associated membrane proteins.
  
9. The granules of platelets include all of the following except
  - A. Dense granules
  - B.  $\alpha$  granules
  - C. Lysosomal granules
  - D.  $\beta$  granules
  
10. Nissl bodies are composed of
  - A. DNA
  - B. RNA with protein
  - C. Lipoprotein
  - D. Fine granules composed of uracil

(p.t.o)  
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11. Steatorrhea occurs due to the deficiency of
  - A. Gastric enzymes
  - B. Pancreatic enzymes
  - C. Salivary enzymes
  - D. Succus entericus
  
12. A male patient aged 45 years presented with the complaints of itching all over the body and history of passing bulky, pale and greasy stool. On examination his conjunctiva is yellowish. What is the probable diagnosis?
  - A. Prehepatic jaundice
  - B. Hepatic jaundice
  - C. Posthepatic jaundice
  - D. Pancreatitis
  
13. Increased frequency of menstruation is called
  - A. Menorrhagia
  - B. Polymenorrhoea
  - C. Oligomenorrhoea
  - D. Dysmenorrhoea
  
14. One of the best tests to assess thyroid functions is
  - A. Assessment of BMR
  - B. PBI estimation
  - C. Radioactive iodine uptake
  - D. Serum TSH and thyroid hormone levels
  
15. The contraceptive method that helps in preventing sexually transmitted disease is
  - A. Cervical cap
  - B. Vaginal ring
  - C. Copper T
  - D. Condom

16. A young male adult presented with infertility. On examination he was found to have testicular atrophy, gynecomastia and X-ray showed osteoporotic changes. Karyotype analysis revealed an extra X chromosome. What is your probable diagnosis?
- A. Turner's syndrome
  - B. Klienfelter's syndrome
  - C. Superfemale
  - D. Supermale
17. The plasma flow through the kidney is 600ml/min and GFR: 120ml/min. What would be the filtration fraction?
- A. 20%
  - B. 25%
  - C. 30%
  - D. 22%
18. Overflow incontinence is seen in
- A. Atonic bladder
  - B. Automatic bladder
  - C. Neurogenic bladder
  - D. Normal bladder
19. A pituitary tumour is removed from a 40 yr old man with acromegaly. It is known that G proteins and adenylyl cyclase normally mediate the secretion of growth hormone secretion by growth hormone releasing hormone (GHRH). Which of the following problem is most likely to be present in patient's tumour cells?
- A. Adenylyl cyclase activity is abnormally low
  - B. The  $G_{\alpha s}$  subunit is unable to hydrolyse GTP
  - C. The  $G_{\alpha s}$  subunit is inactivated
  - D. The  $G_{\alpha i}$  subunit is activated
20. Maternal changes in pregnancy include all of the following except
- A. Increase in blood volume
  - B. Increase in erythropoiesis
  - C. Increase in plasma protein concentration
  - D. Increase in body weight

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**VINAYAKA MISSION'S RESEARCH FOUNDATION, SALEM.  
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**MBBS DEGREE EXAMINATION – June 2021**

**First Year**

**HUMAN PHYSIOLOGY - I**

Time : Three hours

Maximum : 100 marks

**Answer ALL Questions**

Answer Section A in the Answer Sheet attached for 20 marks

After 20 minutes to be handed over to the invigilator immediately Section A

Answer Section B in the main answer book provided

Time : 2 hours 40 minutes

**SECTION – B**

Maximum : 80 marks

**I. Long Answer Questions :**

**(2 x 15 = 30)**

1. A 45 year old lady presented with complaints of tiredness, weakness, fatigue and weight loss for past one month. Her BP was 82/58 mmHg. She also experienced tremors, palpitations, sweating and light-headedness when her food intake was delayed. On examination there was pigmentation in the lips, gums and palmar creases. Her BP in recumbent posture was 94/74 mmHg and pulse rate was 80/min. On standing the BP was 60/40 mmHg and pulse rate was 128/min.
  - a. Comment on the signs and physical findings.
  - b. What is the probable diagnosis? What are the causes for the disease?
  - c. Discuss the pathophysiological basis of the symptoms and signs mentioned here.
  - d. Explain the functions and regulation of the organ involved in the disease.
  - e. What is the complication which can occur in this disease? (2+1+2+3+5+2)
2. Explain in detail the electron microscopic structure of skeletal muscle fiber with a neat diagram. Discuss in detail the molecular mechanism of muscle contraction. Add a note on Rigor mortis. (5+7+3)

**II. Short Answer Questions:**

**(6 x 5= 30)**

3. Describe the role of feedback mechanisms in the regulation of homeostasis. (5)
4. What is DNA fingerprinting? What are its applications? (2+3)
5. List the Neurotrophins and write their functions. (2+3)
6. Classify Gastrointestinal Hormones. What are the functions of gastrin? (2+3)
7. Write about the phases of gastric secretion and its control. (3+2)
8. What are second messengers? Explain the mechanism of action of any one of them. (1+4)

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**III. Brief Answer Questions :**

**(10 x 2 = 20)**

9. What is receptor mediated endocytosis?
10. What is the role of Gap junctions in cardiac muscle?
11. What is ESR? Does it have diagnostic or prognostic value?
12. Distinguish between hemophilia and thrombocytopenia.
13. What are indications for bone marrow examination?
14. State Law of GUT.
15. What is Dumping syndrome?
16. List endocrine functions of kidney.
17. What are the features of Atonic bladder?
18. Mention 2 diuretics and its site of action in renal tubules.

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