M- 003M

MBBS FIRST PROFESSIONAL EXAMINATION, 2021

PHYSIOLOGY

Paper I

Time Allowed: Three Hours **Maximum Marks- 100**

Note:- Attempt all questions. All part of a question should be answered together. Figures in parenthesis indicate marks allotted to a question.

Section-A

Q1. Explain the generation of resting membrane potential in a nerve fibre. (20)

Q2. Write briefly on: (2x10)

(a) Excitation-contraction coupling in skeletal muscle.
(b) Cell mediated immunity

Q3. Multiple Choice Questions: (10x1)

1. **Why do most control systems of the body operate by negative feedback rather than positive feedback?**
   (a) Positive feedback system can bring unstabilty
   (b) Better gain
   (c) Better regulation factor
   (d) Less residual error
2. **The selectivity of protein channel or pores in a cell membrane is due to**
   (a) Helical structure of proteins
   (b) Ion properties
   (c) Pore diameter and electrical charges
   (d) Special arrangement in cell membrane
3. **3% of the macrophage cell membrane is engulfed in the form of vesicles every minute. Which is main cell membrane fibrillar protein involved in this multistage process?**
   (a) Clathrin
   (b) Dyenin
   (c) Spectrin
   (d) Titin
4. **A young woman presents with complaints of weakness in lower extremities, parasthesia, blurring of vision and dysarthria, which are worse in summer. She is diagnosed to have multiple sclerosis. It is due to**
   (a) Vitamin E deficiency
   (b) Cerebral ischemia
   (c) Microangiopathy
   (d) Autoimmune destruction of myelin
5. **A nerve was stimulated using a bipolar stimulating electrode. An electrical stimulus of strength 1mV was applied for stimulation. There was no action potential generated. Thereafter, the strength of stimulus was progressively increased by 1mV and an action potential was generated at 10 mV strength. Which statement is correct regarding the above statement?**
   (a) 1 mV strength stimulus is threshold stimulus
   (b) 9 mV strength stimulus is expected to produce electrotonic potential
   (c) There was no change in resting membrane potential at 9 mV strength stimulus
   (d) Graded potentials are generated at 10 mV strength stimuli

6. Pressure in the urinary bladder falls drastically at the time of voiding but rises back to normal value in a few minutes. This property of smooth muscle is known as
   (a) Latch phenomenon
   (b) Stress relaxation
   (c) Reverse stress relaxation
   (d) Elasticity
7. What condition leads to a deficiency in factor IX that can be corrected with an intravenous injection of vitamin K?
   (a) Classic haemophilia
   (b) Hepatitis B
   (c) Bile duct obstruction
   (d) Genetic deficiency in antithrombin III
8. Mechanism of heparin to prevent blood coagulation is
   (a) Antithrombin III activation
   (b) Binding and inhibition of tissue factor
   (c) Binding available calcium
   (d) Inhibition of platelet-activating factor
9. Binding of IgG and complement to an invading microbe to facilitate recognition is
   (a) Chemokinesis
   (b) Opsonization
   (c) Phagolysosome fusion
   (d) Signal transduction
10. A 44-year-old man presents to emergency with a 2-week history of diarrhea. He has minimal urine output. His stool specimen is positive for parasitic eggs. Which type of WBC would be increased in blood
    (a) Eosinophil
    (b) Monocyte
    (c) Neutrophil
    (d) Lymphocyte

Section-B

Q1. Explain the neural & chemical regulation of respiration. (20)

Q2. Write short notes on: (2x10)
   (a) Glomerular filtration rate.
   (b) Secretion of acid in the stomach

Q3. Multiple Choice Questions: (10x1)

1. Arterial oxygen saturation at height of 20000 ft when one is breathing pure oxygen will be
   (a) 60 mmHg
   (b) 80 mmHg
   (c) 90 mmHg
   (d) 100 mmHg
2. Which of the following decreases with emphysema?
   (a) Alveolar PCO2
   (b) Diffusion area
   (c) Cardiac output
   (d) Pulmonary arterial pressure
3. Which of the following is a true statement
   (a) Compliance is change in pressure per unit change in volume
   (b) Compliance is same during expiration and inspiration
   (c) The alveoli are more compliant in the basal regions
   (d) Respiratory distress syndrome is more common in term babies

4. **The tubular transport maximum for glucose in men is about**
   (a) 180 mg/min
   (b) 220 mg/min
   (c) 280 mg/min
   (d) 375 mg/min
5. **The reabsorption of glucose and amino-acids is most marked in**
   (a) Early part of proximal convoluted tubule
   (b) Late part of proximal convoluted tubule
   (c) Early part of distal tubule
   (d) Late part of distal tubule
6. **A person is accidently lost in an island. He drinks 1 litre of sea water as he couldn't find any other water source in the area. He started feeling thirstier, with dry mouth and skin, had headache. This condition has appeared due to:**
   (a) Loss of obligatory urine volume
   (b) Loss of facultative urine volume
   (c) Overhydration of body fluids
   (d) Loss of dilute urine
7. **The reason for polyuria in Diabetes Mellitus is:**
   (a) Pressure diuresis
   (b) Osmotic diuresis
   (c) Water diuresis
   (d) Pressure natriuresis
8. **A new mother calls the pediatrician because she is concerned that her infant defecates after every meal. Which of the following is the cause of these normal bowel movements in newborns**
   (a) The gastroileal reflex
   (b) The gastrocolic reflex
   (c) Peristaltic rush
   (d) The defecation reflex
9. **Most of the iron absorption occurs in the**
   (a) Duodenum
   (b) Upper jejunum
   (c) Lower jejunum
   (d) Ileum
10. **Pathophysiologic basis of which of the following conditions is associated with damage to the myenteric plexus?**
    (a) Achalasia
    (b) Acute pancreatitis
    (c) Chronic pancreatitis
    (d) Sprue

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