001/24

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation), November - December 2024

Subject: Physiology **Full Marks: 100**
Paper: I **Time: 3 hours**

*Attempt **all** questions. The figures in the margin indicate full marks.*

1. a) A mountaineer on rapid ascent to the peak of a hill 13000 ft height, experienced irritability, headache, breathlessness, nausea, vomiting and sleeplessness. What is the cause of these symptoms? Give reasons. What is acclimatization to high altitude? Discuss the compensatory changes of acclimatization. Enumerate the causes of hypoxic hypoxia. 1+4+2+6+2

   b) A neonate presents with inability to pass stool few days after birth. He had passed meconium on the day of delivery. His abdomen is bloated and the child is in distress. He is diagnosed to be suffering from Hirschsprung's disease. What is the pathophysiology of the disease? Describe the different types of movements of the large intestine. What are the factors influencing gastric emptying? What is blind loop syndrome? 3+6+3+3

2. a) Describe the steps involved in synthesis of Hemoglobin. How does HbS in sickle cell anemia differ structurally from normal Hb? Apart from problems arising out of anemia, what are the other complications of sickle cell anemia? 5+2+3

   b) What is surfactant? Explain how surfactant stabilizes alveoli? What is interdependence? 2+6+2

   c) Describe the mechanism of CO2 transport in the body. What is Haldane effect? What causes the increase of Hematocrit of venous blood? 4+3+3

3. Write short notes on the following: 2x5
   a) Phagocytosis.
   b) Modes of expression of empathy during patient encounters.

4. Explain the following statements: 5x4
   a) Normal saline is effective in hypovolemia.
   b) Negativity is only along the cell membrane.
   c) Low dose aspirin promotes vasodilatation.
   d) Lactobacillus is used in treatment of diarrhea.
   e) Hemolytic jaundice is common in newborn.

5. Choose the correct option for each of the following: 10x1
   i) Osmotic pressure in plasma depends mostly on:
   a) Plasma proteins. b) Na^+
   c) Glucose. d) BUN.

   ii) Spontaneous generation of respiratory rhythm involves:
   a) Acetylcholine. b) Substance P.
   c) Dopamine. d) ATP.

iii) Left ventricular end diastolic pressure increases due to:
a) Increased right atrial pressure. b) Increased ventricular compliance.
c) Prolonged breath holding. d) Decreased ventricular tension.

iv) All of the following are related to electrical activity of intestinal smooth muscle except:
a) Slow waves. b) Generator potential.
c) Spike potential. d) Basal electric rhythm.

v) Eosinopenia is seen in:
a) Bronchial asthma. b) Cushing's syndrome.
c) Worm infestation. d) Urticaria.

vi) Value of which of the following is considered as unit of excitability?
a) Rheobase. b) Chronaxie.
c) Utilization time. d) Refractory period.

vii) Which of the following has the highest diffusion coefficient?
a) Oxygen. b) Carbon dioxide.
c) Carbon monoxide. d) Helium.

viii) After an accident, a man has to undergo removal of part of his intestines, mainly the ileal region. Which of the following conditions is most likely to develop after the surgery?
a) Constipation. b) Macrocytic anemia.
c) Dumping syndrome. d) Hypocalcemic tetany.

ix) Which of the plasma proteins is not synthesized primarily is the liver?
a) Angiotensinogen. b) C- reactive protein.
c) Angiotensin-II converting enzyme. d) Fibrinogen.

x) In a maximal expiration, the total volume expired is:
a) Tidal volume. b) Vital capacity.
c) Expiratory reserve volume. d) Total lung capacity.