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The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation), June, 2022

Subject: Physiology
Paper: I

Full Marks: 100
Time: 3 hours

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

1. a) A 20 year male was brought to the emergency department following a road traffic accident with history of blood loss. On examination there is tachycardia, BP 60/40 mm of Hg. What is the type of shock the patient is suffering from? Enumerate the different types of shock. Describe the stages of shock. If you need to transfuse blood to this patient what are the precautions that you need to take and what are the investigations you need to conduct ? What are the homeostatic mechanisms that will come into play as life saving measures for this patient ? 1+2+2+3+4+3

b) With a labeled diagram show the different secretory glands of stomach. Enumerate their different secretions. Describe the mechanism of gastric acid secretion. How is the stomach itself gets protected from corrosive effect of gastric acid? 4+4+4+3

2. a) What are the different types of chemoreceptors regulating ventilation? How are they stimulated? List the pathways by which increased PCO_2 stimulates ventilation. 2+5+3

b) What is active transport? Discuss secondary active transport with examples. Describe the mechanism of exocytosis. 1+6+3

c) Define cardiac output. What are the factors regulating cardiac output? What are the methods you know which can be utilized to measure cardiac output? Briefly describe one method to measure cardiac output. 2+3+2+3

3. Write a short note on the following: 2x5
   a) Attitude of a doctor towards AIDS patients.
   b) Myasthenia Gravis.

4. Explanation the following statements: 5x4
   a) Hematocrit of the venous blood is more than that of arterial blood.
   b) Low dose Aspirin is prescribed in patients with coronary thrombosis.
   c) Jaundice is produced when a person has a high rate of RBC destruction.
   d) Residual volume in the lung is essential for smooth breathing.
   e) Gastric pH is auto-regulated.

5. Choose the correct option in each of the following: 10x1
   i) Stokes Adams syndrome occurs in :
      a) First degree heart block.
      b) Systemic hypertension.
      c) Wenckebach phenomenon.
      d) Complete heart block.

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ii) Macrophages are the mature forms of:
a) Neutrophils.
b) Basophils.
c) Monocytes.
d) Lymphocytes.

iii) J receptors are present in:
a) Walls of the alveoli.
b) Walls of trachea.
c) Pulmonary capillary wall.
d) Pulmonary interstitium.

iv) Hypokalemia causes:
a) Increased amplitude of action potential.
b) Hyperpolarisation.
c) Resting membrane potential becomes less negative.
d) Tetany.

v) All are secreted as proenzymes except:
a) Trypsin.
b) Chymotrypsin.
c) Pepsin.
d) Ribonuclease.

vi) Patients with human immumo-deficiency virus (HIV) exhibit abnormal functioning of which of the following mechanisms.
a) Antibody production only.
b) T cell-mediated cytoxicity only .
c) Degranulation of appropriately stimulated mast cells.
d) Both antibody production and T cell mediated cytotoxicity.

vii) Resting membrane potential of myelinated nerve fibre is primarily dependent on concentration of :
a) Potassium ion.
b) Sodium ion.
c) Chloride ion.
d) Bicarbonate ion.

viii) Pulmonary compliance depends on all except:
a) Alveolar diameter.
b) Surfactant.
c) State of the interstitium.
d) Amount of capillary blood.

ix) The average end diastolic volume is:
a) 60-80ml.
b) 120-130ml.
c) 180-200ml.
d) 40-60ml.

x) 1 gram of haemoglobin carries :
a) 1.84ml O2.
b) 2.62ml O2.
c) 1.34ml O2.
d) 2.6ml O2.

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