

First Professional MBBS Degree Regular/Supplementary Examinations August 2025 Physiology Paper I

Time: 3 Hours

Total Marks: 100

- Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers
- Indicate the question number correctly for the answer in the margin space
- Answer all parts of a single question together • Leave sufficient space between answers
- Draw table/diagrams/flow charts wherever necessary

1. Multiple Choice Questions

(20x1=20)

The responses for MCQ questions (Q.No. i to Q.No. xx) shall be written in the space provided for answering MCQ questions at page No. 51 of the answer book (the inner portion of the back cover page (PART III)). Responses for MCQs marked in any other part/page of the answer book will not be valued

Question numbers i-v are case scenario-based questions:

A 52-year-old female reports of extreme tiredness and decrease in appetite. The patient is a pure vegetarian and avoids dairy products also. Examination of her oral cavity revealed red beefy tongue with cracks at the angle of mouth. Peripheral smear showed macrocytic hypochromic anemia.

- Dietary factor which is deficient in the above case is
 - Vitamin B₁₂
 - Iron
 - Folic acid
 - Protein
- Most potent stimulus for RBC production is
 - Blood loss
 - Bone marrow hypoxia
 - Bacterial infections
 - Decrease in arterial PO₂
- Intrinsic factor is secreted by
 - Kidney
 - Chief cells of stomach
 - Parietal cells of stomach
 - Beta cells of pancreas
- Colony stimulating factor increases production of all except
 - Lymphocytes
 - Basophils
 - Neutrophils
 - Macrophages
- During the process of erythropoiesis hemoglobin appears in the:
 - Intermediate normoblast stage
 - Initial stage of late normoblast stage
 - later stage of late normoblast stage
 - Reticulocyte stage

For Questions vi-x there are two statements marked as - Assertion (A) and Reason (R). Mark your answer as per options provided

- A is correct R is incorrect
- A is incorrect R is correct
- Both A & R are correct but R is not reason for A
- Both A & R are correct and R is the reason for A

- Assertion:** In many of renal diseases, fluid accumulates in tissue spaces
Reason: Renal diseases decreases urea clearance value
- Assertion:** Heparin is a naturally occurring anticoagulant
Reason: Heparin facilitates the action of antithrombin III
- Assertion:** Digitalis is used in the treatment of heart failure
Reason: Na⁺K⁺ ATPase pump is inhibited by tetradotoxin
- Assertion:** Second heart sound is heard at the start of ventricular systole
Reason: Cause for it is vibrations associated with closure of semilunar valves
- Assertion:** Synthetic surfactant preparations are used in the treatment of infant respiratory distress syndrome
Reason: Maturation of surfactant in the lung takes place near the term

Question numbers xi-xv are multiple response type questions. Read the statements and mark the answers appropriately.

- Hypokinetic pulse is seen in:
 - Congestive heart failure
 - Thyrotoxicosis
 - Dehydration
 - Aortic stenosis
 - 1, 2 and 3 are correct
 - 2, 3 and 4 are correct
 - 1, 3 and 4 are correct
 - 1, 2 and 4 are correct
- Secretion of HCl is stimulated by:
 - Histamin
 - Gastrin
 - Ach
 - Serotonin
 - 1, 2 and 3 are correct
 - 2, 3 and 4 are correct
 - 1, 3 and 4 are correct
 - 1, 2 and 4 are correct

(PTO)

- xiii. Granulocytes are
 1) Neutrophils 2) Monocytes 3) Eosinophils 4) Basophil
 a) 1, 2 and 3 are correct b) 2, 3 and 4 are correct c) 1, 3 and 4 are correct d) 1, 2 and 4 are correct
- xiv. Glomerular filtrate is identical with plasma in respect to the following
 1) pH 2) Electrolytes 3) Protein 4) Glucose
 a) 1, 2 and 3 are correct b) 2, 3 and 4 are correct c) 1, 3 and 4 are correct d) 1, 2 and 4 are correct
- xv. Different stages of deglutition are
 1) Cephalic 2) Oral 3) Pharyngeal 4) Esophageal
 a) 1, 2 and 3 are correct b) 2, 3 and 4 are correct c) 1, 3 and 4 are correct d) 1, 2 and 4 are correct

Question numbers xvi-xx are single response type questions

- xvi. ST segment elevation is seen in:
 a) Atrial septal defect b) Myocardial infarction c) Heart block d) Valvular defect
- xvii. Which of the following is inactivated in lungs
 a) Estrogen b) Angiotensin II c) Bradykinin d) Angiotensin 1
- xviii. Nitrogen washout method is used for measuring:
 a) Dead space volume b) FRC c) Tidal volume d) Diffusion capacity
- xix. Cells responsible for the formation of macrophages
 a) Neutrophils b) Basophils c) Eosinophils d) Monocytes
- xx. Hypoxia cause vasoconstriction in:
 a) Lungs b) Brain c) Intestine d) Heart

Long essays

(2x10=20)

2. 5- year -old child was brought to the emergency in a semi-conscious state. She had 7-8 episodes of loose motion and 4 episodes of vomiting in a day. On examination she was drowsy, pulse was 106/min, regular, low volume, B.P was 80/60 mm Hg, skin turgor was reduced, mouth was dry and respiratory rate was 24/min.
 a) Name the clinical condition
 b) Describe the patho-physiology of this clinical condition
 c) Comment on the patient's pulse and its physiological basis
 d) Describe the management of this patient (1+4+3+2)
3. Describe the composition and functions of gastric juice. Describe various phases and regulation of gastric secretion (2+3+3+2)

Short Essays:

(6x6=36)

4. Describe the pacemaker potential and its conduction (spread) using diagrams
5. Describe the Respiratory adjustments in isotonic exercise. Why isometric exercise is not advised in cardiac patients (4+2)
6. Describe the various forms of CO₂ transport. Add a note on chloride shift (4+2)
7. Draw and label the respiratory centers. Describe Hering -Breuer inflation reflex (3+3)
8. Compare the water reabsorption in proximal and distal parts of the nephrons
9. Explain the barriers that can affect the communication process in a healthcare set-up

Short Answers

(6x4=24)

10. Describe heat stroke and the role of hypothalamus in causing heat loss (2+2)
11. Physiological basis for alkaline urine in high altitude
12. Describe the pathophysiology in achalasia cardia
13. Physiological basis for the renal counter current mechanism
14. Draw and label the Baroreflex pathway
15. Describe the physiological basis and importance of Bombay blood group (3+1)
