2019 and 2024 Scheme

Q.P. Code: 113001 **Reg. no.: ……**

First Professional MBBS Degree Supplementary (SAY) Examinations November 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 **MCQ** questions (Q.No. i to Q.No. xx) shall be answered **only in the OMR sheet provided 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. **For marking the correct responses use X mark only**

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

A middle aged female presents with tongue soreness, diarrhea, fatigue, breathlessness, anorexia, muscle weakness, and pins and needles. Examination reveals pale skin, a red, ulcerated tongue, no palpable spleen, and tachycardia. Lab results show an RBC count of 1 million/mm^3 with irregular, occasionally nucleated RBCs. Upper GI endoscopy shows atrophic mucosa in the stomach.

i. The probable cause of anaemia in this case would be
   a) Dietary deficiency of iron
   b) Suppression of bone marrow by chemicals
   c) Increased Haemolysis
   d) Decreased secretion of Intrinsic factor of Castle

ii. Which of the following findings is most suggestive of pernicious anaemia in this patient
   a) Nucleated RBCs on peripheral smear
   b) Low serum ferritin levels
   c) Normal vitamin B12 levels
   d) Atrophic gastric mucosa

iii. The presence of "pins and needles" sensation in this patient is most likely caused by:
   a) Hypokalemia
   b) Vitamin B_{12} deficiency
   c) Iron deficiency
   d) Chronic diarrhoea

iv. What is the underlying cause of the atrophic mucosa seen in the upper GI endoscopy
   a) Chronic gastric infection
   b) Autoimmune destruction of parietal cells
   c) Helicobacter pylori infection
   d) Malabsorption syndrome

v. The following best describes the red blood cells in this patient based on blood indices.
   a) Microcytic Hypochromic
   b) Normocytic Normochromic
   c) Macrocytic Normochromic
   d) Macrocytic Hypochromic

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

a) Both A & R are correct and R is the reason for A
b) Both A & R are correct and R is not the reason for A
c) A is incorrect R is correct
d) A is correct R is incorrect

vi. **Assertion:** A reduction in vital capacity is observed in Kypho-Scoliosis.
Reason: Spinal deformity restricts the chest wall movement and lung expansion.

vii. **Assertion:** The actual renal threshold for glucose is lower than the theoretical/predicted value under normal conditions.
Reason: Transport maximum for glucose is identical in all the tubules.

viii. **Assertion:** The gastric emptying time is reduced following a fatty meal
Reason: The secretion of cholecystokinin is increased by the presence of fatty acids containing more than ten carbon atoms in the duodenum

ix. **Assertion:** Vasoconstriction of the injured blood vessel is also a step in haemostasis.
Reason: Serotonin secreted by platelets that adhere to the wall of injured vessels causes vasoconstriction.

x. **Assertion:** The blood pressure recorded in blood vessels at heart level in an erect posture varies from that in vessels above or below the heart level.
Reason: The blood pressure in vessels above heart level decreases, while it increases in vessels below heart level due to gravity.

(PTO)

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

xi. The following are types of hypoxia in which oxygen carrying capacity of arterial blood will be normal.
1) Hypoxic hypoxia 2) Stagnant hypoxia 3) Histotoxic hypoxia 4) Anaemic hypoxia
a) 1, 2 and 3 are correct c) 1, 3 and 4 are correct
b) 1, 2 and 4 are correct d) 2, 3 and 4 are correct

xii. The positive deflections in ECG are
1) p 2) q 3) r 4) t
a) 1, 2 and 3 are correct c) 1, 3 and 4 are correct
b) 1, 2 and 4 are correct d) 2, 3 and 4 are correct

xiii. The following are reabsorbed from proximal convoluted tubule:
1) Na+ 2) Glucose 3) H+ 4) H_2O
a) 1, 2 and 3 are correct c) 1, 3 and 4 are correct
b) 1, 2 and 4 are correct d) 2, 3 and 4 are correct

xiv. The lung volumes and capacities measured by spirometry includes:
1) Tidal volume 2) Vital capacity 3) Inspiratory capacity 4) Residual volume
a) 1, 2 and 3 are correct c) 1, 3 and 4 are correct
b) 1, 2 and 4 are correct d) 2, 3 and 4 are correct

xv. The stimulants for HCl secretion in stomach are:
1) Glucagon 2) Gastrin 3) Histamine 4) Acetyl choline
a) 1, 2 and 3 are correct c) 1, 3 and 4 are correct
b) 1, 2 and 4 are correct d) 2, 3 and 4 are correct

Question numbers xvi-xx are single response type questions

xvi. Trypsinogen, a pancreatic proenzyme is activated by
a) Enterokinase b) HCL c) Bicarbonate d) Gastrin

xvii. Pancreatic juice rich in water and electrolytes but poor in enzymes is secreted in response to
a) Insulin b) Cholecystokinin c) Secretin d) Gastrin

xviii. QRS complex in ECG indicates:
a) Atrial repolarisation c) Ventricular depolarisation
b) Ventricular repolarisation d) Atrial depolarisation

xix. The adhesion of platelets to the subendothelial collagen is impaired in the absence of
a) Plasmin b) Heparin c) Antithrombin III d) Von Willebrand factor

xx. The renal tubular Transport maximum for glucose is
a) 375mg/dl b) 375mg/min c) 375gm/dl d) 375gm/min

Long essays **(2x10=20)**

2. An individual was admitted to the hospital following an accident. He was unable to move his right leg due to pain and had blood-soaked clothes. His symptoms included restlessness, extreme weakness, pale and clammy skin, a rapid thready pulse, hypotension, and oliguria.
   a) What is the most probable condition
   b) Define and classify the above mentioned condition
   c) Explain the physiological basis of clinical feature mentioned above
   d) Describe the physiological basis of management of this condition (1+3+4+2)
3. Describe the transport of oxygen in blood. Add a note on Bohr effect. (8+2)

Short Essays: **(6x6=36)**

4. With the help of a schematic diagram, show the steps of intrinsic pathway of blood coagulation. Explain the significance of clot retraction. (4+2)
5. Explain the renal tubular handling of water. Add a note on diuresis. (4+2)
6. Explain the mechanism of HCl secretion in the stomach. Add a note on peptic ulcer.
7. Describe the body's adaptive mechanisms in response to cold.
8. Define and classify immunity. Add a note on cell mediated immunity. (2+4)
9. Describe the ionic basis of phases in pacemaker potential. Explain the conduction of impulse in cardiac conduction tissue. (3+3

Short Answers (**6x4=24)**

10. Write physiological basis of Caisson disease.
11. Draw and label normal spirogram.
12. Write the physiological basis of pale coloured stools in obstructive jaundice.
13. Draw and label left ventricular pressure and volume changes during different phases of cardiac cycle
14. Write the physiological basis of infant respiratory distress syndrome.
15. What is empathy. Explain its importance in patient care.

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