



**UNIVERSITY OF JAFFNA, SRI LANKA**  
**FIRST EXAMINATION FOR MEDICAL DEGREES –JULY 2025**  
**ACADEMIC YEAR 2022/2023**

**PHYSIOLOGY – PAPER II**

**Date:** 23.07. 2025

**Duration:** 9.00 a. m – 12.00 p. m (3 Hours)

Answer All the TEN Questions

Answer each part in **separate** answer book

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**PART A**

1. Briefly explain the basis of:
  - 1.1. Anaemia in individuals who have undergone resection of terminal ileum (30 Marks)
  - 1.2. Prolonged bleeding time in patients with bone marrow disease (35 Marks)
  - 1.3. Repeated administration of hepatitis B vaccine provides more protection than a single administration (35 Marks)
2. A 24-year-old male was admitted with a complaint of repeated vomiting for two days. He also had a history of loss of weight for the past two months. On examination he was dehydrated and drowsy. His respiratory rate was 26 per minute. Investigations revealed the following: Blood sugar - 528mg/dl; Urine ketone bodies ++.
  - 2.1. Explain the basis of the following:
    - 2.1.1. Dehydration (35 Marks)
    - 2.1.2. Loss of weight (30 Marks)
    - 2.1.3. Respiratory rate (25 Marks)
  - 2.2. List **two (2)** important steps in the immediate management of this patient. (10 Marks)
3. Briefly explain the basis of the following:
  - 3.1. Difficulty in swallowing in patients with Achalasia Cardia (35 Marks)
  - 3.2. Icterus in patients with tumor of the head of the pancreas (35 Marks)
  - 3.3. Auto digestion of pancreas **does not** occur in healthy individuals (30 Marks)

4.

- 4.1 Briefly describe the determinants of GFR (40 Marks)
- 4.2 Briefly explain how the renal medullary interstitial hyperosmolarity which is produced by countercurrent multiplier is maintained (30 Marks)
- 4.3 Explain the basis of giving potassium supplements to individuals taking loop diuretics (30 Marks)

5.

- 5.1 Briefly describe the following:
  - 5.1.1 Hypothalamic-pituitary-testicular axis (30 Marks)
  - 5.1.2 Functions of Human Chorionic Gonadotropin (35 Marks)
- 5.2 Explain the basis of giving dopamine agonist to a mother whose baby died one week after birth (35 Marks)

## PART B

6. A 65 year old previously healthy female passed fresh blood while defecating. She continued with her daily activities but the bleeding continued all day. By the evening she was brought to the hospital because of faintish feeling. She had pale and cold extremities with cyanosis. Her Blood Pressure (BP) and Pulse Rate (PR) while sitting were **80/65 mm Hg** and **140/min** respectively.

Her BP and PR when lying down were **95/75 mm Hg** and **110/min** respectively.

Blood report showed hematocrit of **29%**.

- 6.1. Explain the basis of the following in this patient:
  - 6.1.1. Pulse rate of 140/min while sitting (40 Marks)
  - 6.1.2. Changes in BP and PR when lying down (30 Marks)
  - 6.1.3. Hematocrit of 29% (20 Marks)
- 6.2. List **two (02)** factors that contributed to tissue hypoxia in this patient (10 Marks)



7. Explain the physiological basis of the following:
  - 7.1. Orthopnea in left heart failure (40 Marks)
  - 7.2. Wide QRS complex is observed in left bundle branch block (30 Marks)
  - 7.3. Deep sea divers develop joint pain if they **don't** ascend slowly (30 Marks)
  
8. A 30 year old male was brought to the hospital following an accident. He had shallow breathing and signs of progressively worsening respiratory distress. Examinations revealed the following.
  - Airway: no obstruction
  - Respiratory rate: **38/min**
  - Oxygen saturation: **82%** on room air
  - Absent breath sounds on the **right side**
  - Hyper-resonance to percussion on the right chest
  - Tracheal deviation to the **left**
  - Neck vein distention
  - 8.1. State the probable diagnosis. (10 Marks)
  - 8.2. Explain the following in this patient:
    - 8.2.1. Absent breath sounds on the right (30 Marks)
    - 8.2.2. Oxygen saturation of 82 % (35 Marks)
    - 8.2.3. Distension of neck vein (25 Marks)
  
9.
  - 9.1. Briefly describe the mechanism of knee jerk. (35 Marks)
  - 9.2. Differentiate upper motor neuron lesions from lower motor neuron lesions. (40 Marks)
  - 9.3. Explain the cortical influence on the perception of pain. (25 Marks)
  
10.
  - 10.1 Briefly describe how:
    - 10.1.1. Light energy is converted to action potential in the retina. (40 Marks)
    - 10.1.2. Sound energy is converted to electrical signal in the ear. (30 Marks)
  - 10.2. Briefly explain the benefits of sleep. (30 Marks)