

UNIVERSITY OF JAFFNA, SRI LANKA
FIRST EXAMINATION FOR MEDICAL DEGREES – JULY 2026
ACADEMIC YEAR 2023/2024



PHYSIOLOGY – PAPER II

Date: 10.07.2026

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

Answer All the **TEN** Questions

Answer each part in **separate** answer book

PART A

1. Explain the physiological basis of the following:
 - 1.1. Microcytic anemia in individuals with menorrhagia (30 Marks)
 - 1.2. Prolonged prothrombin time in patients with chronic liver cell disease (35 Marks)
 - 1.3. Cancer patients on chemotherapy (drugs that suppress the cancer cells) are more prone to get recurrent infections (35 Marks)
2. Explain the physiological basis of:
 - 2.1. Goiter in individuals with iodine deficiency (30 Marks)
 - 2.2. Weight loss in patients with uncontrolled diabetes mellitus (40 Marks)
 - 2.3. Hyponatremia in patients with Addison's disease (30 Marks)
3.
 - 3.1. Describe the factors that protect the gastric mucosa from gastric acid. (30 Marks)
 - 3.2. Explain the basis of:
 - 3.2.1. Ascites in patients with Chronic Liver Cell Disease (35 Marks)
 - 3.2.2. Giving Oral Rehydration Solution (ORS) to patients with diarrhea (35 Marks)

4.

4.1. Explain the physiological basis of:

4.1.1. Albuminuria in glomerular disease (30 Marks)

4.1.2 Low specific gravity of urine in diabetes insipidus (35 Marks)

4.2. Briefly describe the renal compensatory mechanisms that help to maintain acid-base balance in respiratory failure (35 Marks)

5.

5.1. Briefly describe:

5.1.1 Features seen in the sperm that facilitates successful fertilization (30 Marks)

5.1.2 The functions of Progesterone during pregnancy (30 Marks)

5.2. Explain the physiological basis of encouraging mothers to continue exclusive breastfeeding even if they complain of inadequate secretion of breastmilk immediately after delivery (40 Marks)

PART B

6. A 25-year-old male was brought to the emergency unit following a stab injury in the right chest during an assault. He complained of chest pain and progressively worsening shortness of breath.

Examination findings revealed the following:

- Respiratory rate: **32/min**
- Absent breath sounds on the **right side**
- Hyper-resonance to percussion on the right chest
- Distension of neck veins
- Blood Pressure (BP): **80/40 mm Hg**
- Pulse rate: **120/min**

6.1. Write the primary reason for the above findings. (10 Marks)

6.2. Explain the physiological basis of the following in this patient.

6.2.1. Distension of the neck vein (20 Marks)

6.2.2. Respiratory rate of **32/min** (35 Marks)

- 6.2.3. BP of **80/40 mm Hg** (35 Marks)
7. Explain the physiological basis of the following: (20 Marks)
- 7.1. Tachycardia in fever (40 Marks)
 - 7.2. Increased pulse pressure during heavy physical exercise (40 Marks)
 - 7.3. Patients with left heart failure complains of difficulty in breathing when lying down and feels better when propped up (40 Marks)
8. A 35-year-old female was admitted to the hospital with difficulty in breathing following exposure to pollen in the garden. She had more difficulty in expiration than inspiration. On admission, oxygen saturation was **88 %** and respiratory rate was **28/min**. Peak expiratory flow rate was **150 L/min**. (15 Marks)
- 8.1. Interpret the peak flow rate. (05 Marks)
 - 8.2. Give the probable diagnosis. (15 Marks)
 - 8.3. List **three (03)** changes that could occur in the bronchioles of this patient (35 Marks)
 - 8.4. Explain the physiological mechanism that would have led to the changes in the bronchioles of this patient. (30 Marks)
 - 8.5. Explain the physiological basis of oxygen saturation of **88%** (30 Marks)
9. A patient was admitted to the hospital few hours after a gun-shot injury. His X-ray showed damage in the right half of eighth thoracic vertebra (T_8). Explain the observations in the following and the physiological basis of those observations in both lower limbs of this patient: (30 Marks)
- 9.1. Sensation of proprioception (30 Marks)
 - 9.2. Tone of the muscles on admission (40 Marks)
 - 9.3. Knee jerk after 3 weeks
10. Briefly explain the importance of: (25 Marks)
- 10.1. Sleep for growth (25 Marks)
 - 10.2. Melanin in the eye for vision (25 Marks)
 - 10.3. Middle ear muscles in protecting the ear (25 Marks)
 - 10.4. Sniffing (25 Marks)