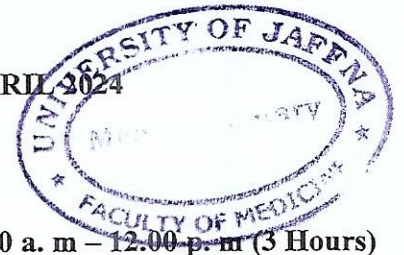




UNIVERSITY OF JAFFNA, SRI LANKA
FIRST EXAMINATION FOR MEDICAL DEGREES – APRIL 2024
ACADEMIC YEAR 2021/2022



PHYSIOLOGY – PAPER II

Date: 02.05.2024

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. A 50 year old male is under chemotherapy for cancer. He was advised to avoid crowded places and to wear a face mask. After one month he developed red colour spots on his body.

Relevant findings of his blood reports are given below:

Hb- 8.2 g/dl

PCV- 26%

MCV 83 fl

MCHC-32 %

WBC- 2500 / μ L (N-25%, L-70%, E-3%, M-2%)

Platelet- 30,000 / μ L

- 1.1. Interpret the Hb level and red cell indices (20 Marks)
1.2. Explain the basis of the interpretation in 1.1. (25 Marks)
1.3. Explain the need for avoiding crowded places and wearing a face mask (20 Marks)
1.4. Explain the basis for red colour spots in his body (35 Marks)

2. A 32 year old patient underwent kidney transplantation. After this surgery, he was given high dose of daily oral Prednisolone (steroid). After three months, patient developed purple striae on the abdomen. He stopped taking Prednisolone on his own. After a few days, he collapsed and was admitted to the emergency unit. His Blood Pressure on admission was 80/60 mm Hg.

- 2.1. Briefly explain the basis of the following in this patient:
2.1.1. Giving steroids after kidney transplantation (20 Marks)
2.1.2. Developing purple striae (30 Marks)
2.2. List five (5) other signs that he might develop due to Prednisolone treatment (10 Marks)
2.3. Explain the basis of collapse after stopping Prednisolone (40 Marks)

3. A 42 year old male was admitted with a complaint of passing bulky, fatty stools for three months. The stool frequency was 4-5 times a day. He also complained of unintentional weight loss of 14 kg during this period.

On examination he had signs of dehydration. His fasting blood sugar was 245 mg/dl. Further investigations revealed a diagnosis of chronic pancreatitis.

- 3.1. List five (5) clinical features of dehydration (10 Marks)
- 3.2. Explain the basis of the following in this patient:
- 3.2.1. Fasting blood sugar of 245 mg/dl (30 Marks)
- 3.2.2. Bulky, fatty stools (20 Marks)
- 3.2.3. Weight loss (40 Marks)
4. 4.1. Describe:
- 4.1.1. Tubuloglomerular feedback (40 Marks)
- 4.1.2. H^+ secretion in distal convoluted tubules (30 Marks)
- 4.2. Briefly explain the basis of Plasma K^+ of 3.1 mEq/L in a patient taking Thiazide diuretic. (30 Marks)
5. 5.1. Briefly describe the functions of Testosterone during fetal life. (30 Marks)
- 5.2. Explain the basis of the following:
- 5.2.1. Measuring Progesterone on day 21 of menstrual cycle (35 Marks)
- 5.2.2. Using ovarian hormones for contraception (35 Marks)

6. A 55 year old male, with Chronic Obstructive Pulmonary Disease was admitted to the hospital with worsening of shortness of breath and cough for 5 days. On examination his respiratory rate was 36/min and nail beds were blue. Pulse oxymeter reading revealed an oxygen saturation of 80%.

His arterial blood gas analysis showed the following

pH- 7.30

PaO₂- 60 mmHg

PaCO₂- 55mm Hg

HCO₃⁻ - 32mEq/L



- 6.1. State the acid base abnormality of this patient (10 Marks)
- 6.2. Explain the following observations in this patient
- 6.2.1. Oxygen saturation of 80 % (35 Marks)
- 6.2.2. Respiratory rate of 36/min (40 Marks)
- 6.2.3. Bluish discolouration of nail beds (15 Marks)
7. A 60 year old male was admitted to the emergency unit with difficulty in breathing when lying flat. His blood pressure was 85/60 mmHg and the pulse rate was 105/min. He had a previous history of myocardial infarction.

Explain the physiological basis of the following in this patient

- 7.1. Blood pressure of 85/60 mmHg (25 Marks)
- 7.2. Pulse rate of 105/min (35 Marks)
- 7.3. Difficulty in breathing when lying flat (40 Marks)
8. Explain the physiological basis of the following
- 8.1. Patients with long standing uncontrolled diabetes are at risk of fainting when they suddenly get up from bed (35 Marks)
- 8.2. Cardiac output is reduced at the heart rate of 220/min (40 Marks)
- 8.3. Short QRS complex is seen in hypothyroidism (25 Marks)

9. Explain the physiological basis of:
- 9.1. Fatigue of muscles in Myasthenia gravis (35 Marks)
 - 9.2. Exaggerated deep tendon reflex in upper motor neuron lesion (40 Marks)
 - 9.3. Sleep deprived children are at risk of impaired growth (25 Marks)
10. Briefly describe:
- 10.1. Localization of pain sensation (25 Marks)
 - 10.2. Auditory localization of source of sound (25 Marks)
 - 10.3. Visual perception of accurate distance of an object (25 Marks)
 - 10.4. Perception of smell of a substance (25 Marks)