

**UNIVERSITY OF JAFFNA, SRI LANKA**  
**FACULTY OF MEDICINE**  
**SECOND EXAMINATION FOR MEDICAL DEGREES –March 2009**

**Physiology: Paper II**

ANSWER ALL THE TEN QUESTIONS  
ANSWER EACH PART IN SEPARATE ANSWER BOOK  
Date: 13.03.09.  
Time: 03 hours

Part A

1. Blood sample was obtained from a 30 year old male to determine Hb concentration, RBC count, PCV and ESR.
  - 1.1 List the normal values of the parameters mentioned in 1.0 ( 10 Marks)
  - 1.2 List four causes that can increase PCV ( 20 Marks)
  - 1.3 List any two indices you may derive using the parameters mentioned in 1.0 ( 20 Marks)
  - 1.4 Briefly write how you may derive the indices mentioned in 1.3 and explain the usefulness of them in medicine ( 50 Marks)
  
2. Write short notes on the following:
  - 2.1 Synaptic transmission ( 30 Marks)
  - 2.2 Adrenergic receptors ( 35 Marks)
  - 2.3 Summation contraction ( 35 Marks)
  
3.
  - 3.1 Briefly write the secretory control of glucocorticoid hormone ( 30 Marks)
  - 3.2 List the chief effects of the hormone mentioned in 3.1 ( 20 Marks)
  - 3.3 Write short notes on the effects of over secretion of the hormone mentioned in 3.1 ( 50 Marks)
  
4. 30 year old male patient came to a hospital with persistent vomiting.
  - 4.1.1 Explain the physiological basis for the change in pH of blood in this patient ( 35Marks)
  - 4.1.2 Explain the physiological mechanism of vomiting ( 50 Marks)
  - 4.2 List any three tests you may perform to assess his liver functions ( 15 Marks)
  
5.
  - 5.1 Define menstrual cycle ( 20 Marks)
  - 5.2 Briefly write the hormonal control of the secretory phase of menstrual cycle ( 40 Marks)
  - 5.3 Explain briefly the physiological mechanism which may inhibit the ovulation during breast feeding ( 40 Marks)

## Part B

6. Describe the physiological basis of the following observations
- 6.1. Heart rate of patients after heart transplantation is about 100/min. (30 Marks)
- 6.2. Reduction of cardiac output in patients with ventricular dysfunction will be very much more than that of patients with atrial dysfunction. (40 Marks)
- 6.3. When ECG is recorded, patients with chronic hypertension will have tall R or deep S waves. (30 Marks)
7. Mr. Raman, 30 years old, was admitted to the hospital after 4 hours of fall from height. He fell on a pile of garbage where a piece of metal has pierced the right chest. His tongue and limbs were cyanosed and he was finding it difficult to breathe. The blood pressure was 90 / 75 and the pulse rate was 112/min. The respiratory rate was 40/min. The apex beat was felt 4 centimeters lateral to the mid-clavicular line. The signs and symptoms were worsening progressively. On percussion, the left side was dull but the right chest was resonant all over. [Percussion is tapping on the chest and solids and fluids underneath give dull sound and air gives resonant sound]
- 7.1. Name the condition. (10 Marks)
- 7.2. Describe the physiological basis of the following symptoms and signs observed in this patient.
- 7.2.1. Cyanosis (15 Marks)
- 7.2.2. Respiratory rate (25 Marks)
- 7.2.3. Blood pressure (25 Marks)
- 7.2.4. Pulse rate (25 Marks)
8. Describe the physiological basis of diuresis observed in the following conditions / situations
- 8.1. Excessive drinking of water (30 Marks)
- 8.2. Deficiency of insulin (30 Marks)
- 8.3. Injection of Frusemide [inhibitor of sodium absorption in loop of Henle] (40 Marks)
- 9.1. List 5 types of pain (10 Marks)
- 9.2. Describe referred pain with two examples (30 Marks)
- 9.3. Describe the physiological basis of change in blood pressure following multiple fractures (30 Marks)
- 9.4. Describe the physiological basis of anger generated by pain sensation (30 Marks)
- 10.1. Describe the uses / importance of taste sensation (30 Marks)
- 10.2. Describe air conduction of sound in the ear with two examples of hearing loss due to defect in air conduction. (40 Marks)
- 10.3. Describe the perception of linear acceleration (30 Marks)