

UNIVERSITY OF JAFFNA, SRI LANKA
FIRST EXAMINATION [2] FOR MEDICAL DEGREES –April-May 2010
Physiology: Paper II

Date: 04. 05. 2010.

Time: 03 hours
9.00 A.M.-12.00 noon.

Answer all the ten questions

Write the answers for each part in separate answer book

PART A

1. 1.1. List the plasma concentrations (in mEq/l) of the following ions: (10 marks)
 K^+ , Na^+ , Ca^{2+} , HCO_3^- & Cl^-
- 1.2. Write the effects of Hypokalaemia & Hypocalcaemia in a person. (20 marks)
- 1.3. Briefly describe a physiological mechanism that leads to Hypernatraemia. (40 marks)
- 1.4. Briefly describe the mechanisms which lead to Hyperkalaemia. (30 marks)
2. Write short notes on:
 - 2.1. Synaptic transmission. (35 marks)
 - 2.2. Contraction of skeletal muscle. (35 marks)
 - 2.3. Saltatory conduction. (30 marks)
3. A 24 year old male student was exercising on a treadmill at high speed with a fixed resistance. His respiratory rate and minute ventilation were determined at the end of his exercise.
 - 3.1. Write the resting respiratory rate and minute ventilation (10 marks)
 - 3.2. Describe the effect of exercise on the parameters mentioned in 3.1 (20 marks)
 - 3.3. Briefly describe the physiological mechanisms responsible for the effects mentioned in 3.2 (50 marks)
 - 3.4. From the data determined in this experiment, how do you obtain the person's tidal volume (20 marks)
4. Write short notes on the following:
 - 4.1. Prolactinaemia (25 marks)
 - 4.2. Critinism (40 marks)
 - 4.3. Addison's disease (35 marks)
5. 5.1. Write the normal sperm count of a young adult (10 marks)
- 5.2. Write the sperm count below which infertility occurs (15 marks)
- 5.3. Briefly describe the endocrine control of spermatogenesis (40 marks)
- 5.4. Briefly describe the contraceptive methods which can be adopted by males. (35 marks)

PART B

6. Mr. Kandiah, 40 years old healthy male, was admitted to the hospital with a history of fall from a tall tree. On examination, he was found to have fracture of T10 vertebra which has caused complete damage to the spinal cord in it.
- 6.1. Describe the change in the cutaneous sensations in this patient. (30 Marks)
 - 6.2. Describe the state of the motor system of the lower limbs on admission. (40 Marks)
 - 6.3. Describe the state of the motor system of the lower limbs after 2 weeks (30 Marks)
7. Describe the physiological basis of the following findings on admission of Mr. Kandiah mentioned in question 6.
- 7.1. His blood pressure was 80/50 on admission and it became 110/70 after injection of pethidine [a drug used for pain relief]. (35 Marks)
 - 7.2. His legs were warmer than the hands (30 Marks)
 - 7.2. His bladder was distended and he could not pass urine and a catheter was inserted to collect urine. (35 Marks)
- 8.
- 8.1. List the stages in erythropoiesis (10 Marks)
 - 8.2. Describe briefly the change in erythropoiesis in iron deficiency (30 Marks)
 - 8.3. Describe the physiological basis of anaemia in chronic renal failure (30 Marks)
 - 8.4. Briefly describe the function of neutrophil (30 Marks)
- 9.
- 9.1. Define renal clearance (15 Marks)
 - 9.2. Briefly describe measurement of glomerular filtration rate using clearance method. (40 Marks)
 - 9.3. Describe the physiological mechanisms that are responsible for conservation of water in the body (45 Marks)
10. Explain the physiological basis of the following observations:
- 10.1. When the blood flow to the forearm is restored after occlusion for 4 minutes, the forearm becomes reddish and warm (30 Marks)
 - 10.2. When the left hand is immersed in warm water, blood flow to the right forearm was increased (30 Marks)
 - 10.3. When someone looks directly at a small object in dim light that object is not seen (40 Marks)
