



Second Examination for Medical Degrees  
PHYSIOLOGY - Paper II

16<sup>th</sup> May 2018

Time: Three hours

Answer all questions

Answer each question in a separate book

1. A 28 year-old male met with a road traffic accident and lost considerable amount of blood from the injured lower limb. His examination findings on admission were as follows: Pulse rate – 130/min, blood pressure 80/50 mmHg, Respiratory rate 26/min. Investigations revealed elevated lactic acid concentration in his blood.
  - 1.1 What is the diagnosis as suggested by the above features? ( 5 marks)
  - 1.2 What is the reason for elevated lactic acid concentration? (15 marks)
  - 1.3 Explain the reasons for his pulse rate and blood pressure values. (40 marks)
  - 1.4 Explain the reasons for his respiratory rate. (40 marks)
  
2.
  - 2.1 Describe the physiological basis for the acid-base and electrolyte disturbances seen in Addison disease. (30 marks)
  - 2.2 State two other clinical signs present in a patient with Addison disease and explain the physiological mechanisms of their development. (30 marks)
  - 2.3 Pernicious anaemia is an autoimmune disease associated with Addison disease. Describe the process of vitamin B<sub>12</sub> absorption in a normal person and explain how it is affected in pernicious anaemia. (40 marks)
  
3. A 50 year-old known diabetic patient presented to the hospital with bilateral ankle oedema. On examination he had elevated blood pressure. On investigating, he was found to have glucose and protein in his urine. His GFR was assessed by creatinine clearance which was found to be low. He was diagnosed as having chronic kidney disease due to diabetes mellitus.  
Explain the physiological basis of
  - 3.1 development of bilateral ankle oedema in this patient (30 marks)
  - 3.2 appearance of glucose in his urine (35 marks)
  - 3.3 using creatinine clearance to assess GFR (35 marks)
  
4. A person had a below elbow amputation of his right arm about one year ago. He complains of intermittent pain that is coming from the right thumb that was removed.
  - 4.1 Explain physiological reasons for this pain. (30 marks)
  - 4.2 He has taken aspirin (a type of NSAID) as a treatment to his pain without much benefit. When he consulted a doctor, he prescribed a drug that act on opioid receptors (an opioid). There was a good response for opioid. Discuss the use of opioid and aspirin as treatments for pain in this condition. (40 marks)
  - 4.3 Another treatment option for this pain is to use a method operate through gate control theory (such as acupuncture and TENS).  
Explain the gate control theory. (30 marks)
  
5. Explain the physiological basis of
  - 5.1 subfertility in prolactinoma (35 marks)
  - 5.2 polycythaemia in chronic smokers (35 marks)
  - 5.3 having lower temperature in extremities than the core temperature (30 marks)