



SECOND EXAMINATION FOR MEDICAL DEGREES

PHYSIOLOGY II

October 2013

TIME: THREE HOURS

Answer all questions. Answer each question in a separate book.

1. In the immunization schedule of Sri Lanka, mumps vaccination is included at 12 months (1st dose) and at 3 years (2nd dose).
 - 1.1 List five components of immune system and state one function of each. (25 marks)
 - 1.2 List the main types of immunoglobulins found in the body. (10 marks)
 - 1.3 Describe the special characteristics of above mentioned immunoglobulins. (25 marks)
 - 1.4 Explain the physiological basis of giving two doses of the same vaccine with a time interval. (40 marks)

2. A 50 year-old patient with ischaemic heart disease was admitted to hospital with fatigue and dyspnoea. Investigations revealed that there is cardiomegaly with reduced ejection fraction. Patient was treated with several drugs including digoxin (a positive inotrope).
 - 2.1 What is the most likely diagnosis? (10 marks)
 - 2.2 Explain the term "ejection fraction". (20 marks)
 - 2.3 Explain the mechanism for the reduction of ejection fraction in this patient. (30 marks)
 - 2.4 Explain the physiological basis for treating this patient with digoxin. (40 marks)

3. Furosemide (a loop diuretic) was prescribed together with oral KCl to a patient who had generalized oedema. KCl was given to prevent furosemide induced hypokalaemia. His urine output increased and oedema reduced gradually.
 - 3.1 Explain the effect of furosemide on urine volume. (40 marks)
 - 3.2 Explain how treatment with furosemide leads to hypokalaemia. (30 marks)
 - 3.3 Explain how treatment with furosemide reduces oedema. (30 marks)

4. The reproductive system of women shows regular cyclic changes.
 - 4.1 Describe regulation of ovulation by hypothalamo-pituitary-gonadal axis. (40 marks)
 - 4.2 Explain how oral contraceptive pills affect ovulation. (30 marks)
 - 4.3 Explain the effect of pregnancy on the above axis. (30 marks)

5. Explain the physiological basis for the following.

- 5.1 Treatment of peptic ulcers with proton pump inhibitors. (25 marks)
- 5.2 Use of acetylcholine esterase inhibitors in myasthenia gravis. (25 marks)
- 5.3 Inclusion of Na^+ and glucose in ORS. (25 marks)
- 5.4 Modification of respiration by stimulation of carotid chemoreceptors. (25 marks)

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