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UNIVERSITY OF RUHUNA – FACULTY OF MEDICINE

ALLIED HEALTH SCIENCES DEGREE PROGRAMME

FIRST BPHARM PART II EXAMINATION – AUGUST 2014

PH 1254: HUMAN BIOLOGY II (SEQ)

TIME: THREE HOURS

INSTRUCTIONS

- Answer all questions.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

1.

1.1 State the main arteries that supply the brain. ***(10 marks)***

1.2 Describe briefly the ventricular system of the brain using a clearly labeled diagram. ***(30 marks)***

1.3 Name the meninges and describe briefly their arrangement in the central nervous system. ***(30 marks)***

1.4 Describe briefly the structure of a neuron using a clearly labeled diagram. ***(30 marks)***

2.

2.1 Compare and contrast skeletal muscle and smooth muscle. ***(15 marks)***

2.2 Describe briefly the arrangement of the lymphatic system in the body. ***(15 marks)***

2.3 Describe the parts of a nephron using a clearly labeled diagram. ***(20 marks)***

2.4 Describe the structure of the testis. ***(25 marks)***

2.5 Outline the arrangement of endocrine system. ***(25 marks)***

3. When impulses transmit through a neuron, the resting electrical state alters transiently and come back to the resting state again.

3.1 What is the resting membrane potential? *(10 marks)*

3.2 What are the important mechanisms to maintain this resting membrane potential? *(20 marks)*

3.3 Write **two** ionic processes occur during impulse transmission in a neuron. *(20 marks)*

3.4 When an impulse arrives synapse, there is a mechanism to secrete neurotransmitters. Briefly describe that mechanism. *(20 marks)*

3.5 As a result of impulse crossing the synapse, excitatory postsynaptic potential or inhibitory postsynaptic potential will be generated in postsynaptic neuron.

3.5.1 What factors determine whether it is excitatory postsynaptic potential or inhibitory postsynaptic potential? *(10 marks)*

3.5.2 What are the differences between excitatory postsynaptic potential and inhibitory postsynaptic potential? *(20 marks)*

4.

4.1 Explain the ionic basis of development of an action potential in a skeletal muscle using a clearly labeled diagram of an action potential. *(30 marks)*

4.2 Explain the following terms in relation to action potentials that occur in a skeletal muscle.

4.2.1 Absolute refractory period *(10 marks)*

4.2.2 Relative refractory period *(10 marks)*

4.3 Explain the events that take place at the neuromuscular junction during neuromuscular conduction. *(25 marks)*

4.4 Explain how the drug neostigmine helps to improve the symptoms of patients with myasthenia gravis. *(25 marks)*

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5.

5.1 State briefly the average intake and output of water in a healthy young adult male.
(15 marks)

5.2 State the amount of water and its distribution in different compartments of the body in a healthy young adult male.
(20 marks)

5.3 Name **three** physiological causes for change in water content of the body.
(10 marks)

5.4 State the normal concentrations of sodium, potassium and calcium ions in different compartments of the body. *(15 marks)*

5.5 State the possible changes in potassium concentration with their complications.
(10 marks)

5.6 Describe briefly the starling forces. *(25 marks)*

5.7 Define oedema . *(05 marks)*

6.

6.1 List **two** hormones secreted by the kidney. *(08 marks)*

6.2 What are the main functions of the hormones mentioned above? *(10 marks)*

6.3 List **three** functions of kidney (other than secretion of above hormones) *(12 marks)*

6.4 Although glucose does not appear in urine of a healthy individual, glucose appears in urine of a patient with untreated diabetes mellitus. Explain the physiological basis for it.
(20 marks)

6.5 What is puberty? *(10 marks)*

6.6 Explain the following events of puberty in a girl. *(15 marks)*

6.6.1 Thelarche
6.6.2 Pubarche
6.6.3 Menarche

6.7 A pregnant woman does not secrete milk although her serum prolactin level is high. After the delivery of the baby, she starts to secrete milk despite lower the serum prolactin level. Explain. *(25 marks)*