



**UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES**

**DEPARTMENT OF PHARMACY**

**FIRST BPHARM PART II EXAMINATION-JUNE/JULY 2023**

**PH 1254 HUMAN BIOLOGY II – SEQ**

**TIME: THREE HOURS**

**INSTRUCTIONS**

- There are six questions in parts A, B, C, D, E and F in this SEQ paper.
- Answer all questions.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

**PART A**

**01.**

- 1.1 Explain the physiological basis of the resting membrane potential in a skeletal muscle. (20 marks)
- 1.2 Briefly explain the ion fluxes that take place during an action potential of a skeletal muscle. (10 marks)
- 1.3 Draw a diagram to show the temporal relationship between an action potential and the mechanical response in a skeletal muscle. (10 marks)
- 1.4 Explain how the above temporal relationship allows tetanization of skeletal muscles. (10 marks)

**PART B**

- 1.5 List five post-menopausal symptoms. (10 marks)
- 1.6 After the menopause estrogen level decreases and FSH and LH levels increase. Explain the physiological basis. (20 marks)
- 1.7 Some lactating mothers do not start menstrual cycles until they stop breast feeding. Explain the physiological basis. (20 marks)

**PART C**

**02.**

- 2.1 State four factors governing the filtration across the glomerular capillaries. (05 marks)
- 2.2 Briefly explain the mechanisms available at the nephrons to regulate blood pH. (15 marks)
- 2.3 Briefly explain the factors contributing for generation and maintenance of hyperosmolar interstitium of the medulla of the kidney. (15 marks)
- 2.4 Briefly explain the water absorption at collecting ducts. (15 marks)

**PART D**

- 2.5 State the normal range fasting blood glucose level of a healthy adult. (10 marks)
- 2.6 What is diabetes mellitus? (10 marks)
- 2.7 State three classic symptoms of diabetes mellitus. (10 marks)



- 2.8 State two hormones secreted by the pancreas that controls blood glucose levels. (05 marks)
- 2.9 Briefly explain the mechanisms of action of the two hormones mentioned in 2.8 in relation to controlling the blood glucose levels in healthy adults. (15 marks)

03.

- 3.1 State four functions of calcium in the body. (10 marks)
- 3.2 State two hormones that are responsible for calcium homeostasis. (05 marks)
- 3.3 Briefly explain how the two hormones mentioned in 3.2 act to elevate plasma calcium levels in a healthy adult. (25 marks)
- 3.4 State two causes of rickets. (04 marks)
- 3.5 State the three major clinical features of rickets. (06 marks)
- 3.6 State four clinical features of Addisonian crisis. (10 marks)
- 3.7 Briefly explain how sudden cessation of prednisolone after a long-term usage can lead to Addisonian crisis. (30 marks)
- 3.8 What measure can be taken to prevent an Addisonian crisis in a patient who has been taking prednisolone for six months and now needs to stop the treatment? (10 marks)

### PART E

04.

- 4.1 Describe the ionic basis of the generation of action potential in the nerves using a labeled diagram. (40 marks)
- 4.2 Outline the functions of extrapyramidal tracts. (15 marks)
- 4.3 List five types of receptors found in the skin. (15 marks)
- 4.4 List five types of receptor neurons of special senses and its cranial nerve supply. (20 marks)
- 4.5 Outline two functions of blood brain barrier. (10 marks)

### PART F

05.

- 5.1
- 5.1.1 Describe the gross anatomical structure of the kidney. (40 marks)
- 5.1.2 Name the parts of the nephron using a labeled diagram. (15 marks)
- 5.2 Outline the blood supply of the brain. (30 marks)
- 5.3 List the major components of the lymphatic pathway. (15 marks)

06.

- 6.1
- 6.1.1 List the types of bones classified according to the morphology. (10 marks)
- 6.1.2 Briefly describe the structure and features of a synovial joint. (30 marks)
- 6.2
- 6.2.1 List the components of the male reproductive system. (15 marks)
- 6.2.2 Briefly describe the gross anatomical structure of the testis. (30 marks)
- 6.3 Name cell types and their hormones of the thyroid gland. (15 marks)

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