



UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

FIRST BPHARM PART I EXAMINATION – FEBRUARY 2022

PH 1144 HUMAN BIOLOGY I – SEQ PAPER

TIME: THREE HOURS

INSTRUCTIONS

- There are **six** questions in parts **A, B, C, D, E, F, G and H** 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

1.
 - 1.1. State a special function of the cell membrane of excitable tissues. **(05 marks)**
 - 1.2. The permeability of the substance through the cell membrane determines the rate of diffusion through the membrane. Describe the factors that determine the permeability of substance through the cell membrane. **(30 marks)**
 - 1.3. Chemical signaling is the main mechanism by which biological function is controlled at all levels. Define a receptor. **(05 marks)**
 - 1.4. List types of receptors. **(10 marks)**
 - 1.5. Describe the receptor response in relation to increased concentration of full antagonist, antagonist and inverse agonist in the blood. **(20 marks)**
 - 1.6. Explain up regulation and down regulation of receptors. **(30 marks)**

PART B

2.
 - 2.1. State five functions of blood. **(10 marks)**
 - 2.2. State five categories of plasma components with an example for each category. **(10 marks)**
 - 2.3. List five types of white blood cells giving one function of each cell type. **(10 marks)**
 - 2.4. State five signs and/or symptoms of anemia. **(10 marks)**
 - 2.5. Classify anemia according to morphology and state one disorder for each. **(10 marks)**

PART C

- 2.6. State three functions of the Stomach. (10 marks)
- 2.7. Explain how NSAID treatment may leads to formation of gastric ulcers. (40 marks)

3.

- 3.1. Explain why pancreas is not auto digested by its enzymes. (25 marks)

PART D

- 3.2. What is hypoxia? (04 marks)
- 3.3. List three types of hypoxia. (06 marks)
- 3.4. Explain the physiological basis for following.
- 3.4.1. When a person travels to a high altitude, there is an increase in the respiratory rate. (40 marks)
- 3.4.2. People living in high altitudes (high mountains) have high haemoglobin concentration. (25 marks)

PART E

4.

- 4.1. State the reason for the following in ECG. (16 marks)
- 4.1.1. P wave
- 4.1.2. PR interval
- 4.1.3. QRS complex
- 4.1.4. T wave
- 4.2. Explain the effect of the following on the cardiac output.
- 4.2.1. Ventricular filling time (12 marks)
- 4.2.2. Gravity (12 marks)
- 4.2.3. Constrictive pericarditis (10 marks)
- 4.3. Explain the physiological basis for following.
- 4.3.1. During the initial stages of hypovolaemic shock, blood pressure may not drop significantly. (30 marks)
- 4.3.2. A young patient with hypertension was requested to get serum electrolyte measurements (Na^+ and K^+). (20 marks)

PART F

5.

- 5.1. List three differences between prokaryotic and eukaryotic cells in a format of a table. **(06 marks)**
- 5.2. List five different types of membrane bound organelles found in human cell. **(10 marks)**
- 5.3. Write an account of the structure of a mitochondrion using a correctly labeled diagram. **(24 marks)**
- 5.4. List five different types of human tissues giving examples for two different types of cells in each of them. **(35 marks)**

PART G

6.

- 5.5. State the structural components of pulmonary circulation using a labeled diagram. **(25 marks)**
- 6.1. Illustrate the layers of the heart wall and the pericardium using a labeled diagram. **(20 marks)**
- 6.2. State the structural adaptations of the trachea to achieve its functions. **(30 marks)**

PART H

- 6.3. Name the components of the gastrointestinal tract (GIT) using a labeled diagram. **(15 marks)**
- 6.3.1. Illustrate the types of epithelia of the GIT from mouth to anus. **(15 marks)**
- 6.3.2. Name three associated glands of the GIT and their functions. **(20 marks)**

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