



UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

FIRST BPHARM PART I EXAMINATION – NOVEMBER/DECEMBER 2019

PH 1123 BIOCHEMISTRY I (SEQ)

TIME: TWO HOURS

INSTRUCTIONS

- There are **four** questions in **A**, **B** and **C** parts of the SEQ paper.
- Answer **each** part in a separate booklet.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

PART A

1. Write short notes on following.

- 1.1. Serine proteases (25 marks)
- 1.2. Integrin (25 marks)
- 1.3. Passive transport (25 marks)
- 1.4. Cell division of eukaryotes (25 marks)

2.

- 2.1. Explain briefly how glycolysis is regulated in the body. (20 marks)
- 2.2. Briefly explain the electron transport chain. (30 marks)
- 2.3. State **two** by-products of the hexose monophosphate pathway and their importance. (20 marks)
- 2.4. Explain the importance of ascorbic acid as supplementary to humans. (30 marks)

PART B

3. Answer all parts.

- 3.1. What is meant by an exergonic reaction? Draw an energy diagram for an exergonic or spontaneous reaction. (20 marks)
- 3.2. Glucose-6-phosphate is formed from glucose in an ATP utilizing reaction. Write the overall reaction and calculate the ΔG^0 of it using the following information.



Giving reasons indicate whether the overall reaction is spontaneous or not. (30 marks)

3.3 Define the following terms pertaining to enzyme catalysis:

3.3.1 Coenzyme, apoenzyme and holoenzyme. (15 marks)

3.3.2 Michaelis constant and turn over number (10 marks)

3.4 In the presence of alcohol dehydrogenase, the rate of reduction of acetaldehyde to ethanol increases with the concentration of acetaldehyde. Eventually the rate of the reaction reaches a maximum, where further increases in the concentration of acetaldehyde have no effect.

3.4.1 Sketch the initial velocity (v_0) versus substrate concentration [S] graph to show this observation. Briefly explain why. (15 marks)

3.4.2 Explain mathematically how a value for K_m can be estimated from the v_0 versus [S] graph. (10 marks)

04. Answer all parts.

4.1. Draw the general structure of a fat (using R-groups for the fatty acid) and describe how the β - oxidation of;

4.1.1. even chain fatty acids (10 marks)

4.1.2. odd chain fatty acids differ in terms of products formed. (10 marks)

4.2. There are four steps in the β -oxidation pathway of a fatty acids. Give the sequence of these four reactions. (15 marks)

4.3. Calculate the net energy yield (number of ATP) from one molecule of palmitate (16 carbons) is completely oxidized to CO_2 and H_2O by the β -oxidation sequence and the Kerb's cycle. (15 marks)

PART C

4.4.

4.4.1. What is meant by "malabsorption"? (10 marks)

4.4.2. Briefly explain **four** factors that may lead to malabsorption. (40 marks)

@@@@@@@@@@