



UNIVERSITY OF TECHNOLOGY, JAMAICA
SCHOOL OF PHARMACY AND HEALTH SCIENCE

FINAL/RESIT EXAMINATION

GROUP: BPHARM 1 DATE: April/May 2009

SUBJECT: BIOCHEMISTRY (CHY 1007) DURATION: 2 HOURS

INSTRUCTIONS: 1. ANSWER ALL THE QUESTIONS IN SECTION I
2. ANSWER ANY ONE (1) QUESTION IN SECTION II

SECTION 1 (85 Marks)

INSTRUCTIONS: ANSWER ALL QUESTIONS

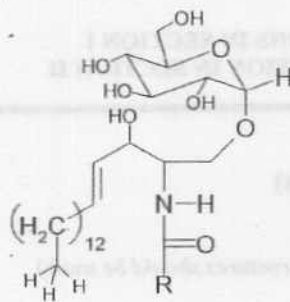
(Where appropriate, the use of suitable examples and/or structures should be used.)

1.
$$\begin{array}{c} \text{H}-\text{C}=\text{O} \\ | \\ \text{H}-\text{C}-\text{OH} \\ | \\ \text{HO}-\text{C}-\text{H} \\ | \\ \text{H}-\text{C}-\text{OH} \\ | \\ \text{CH}_2\text{OH} \end{array}$$
 COMPOUND A
- a) How would you completely classify the **compound A** above? [1]
- b) (i) What is the basis for the formation of different structures of this compound in an aqueous solution? [2]
(ii) Draw all the structures that you would expect for any **hexose** in an aqueous solution. [6]
- c) DNA $\xrightarrow{\text{(i)}}$ RNA $\xrightarrow{\text{(ii)}}$ Protein [6]
(i) State and describe the processes indicated by (i) and (ii). [6]
(ii) Draw the structure of any two (2) **pyrimidine** and any one (1) **purine** base. [6]
(iii) Briefly describe any application of recombinant DNA. [3]
- d) (i) Mr. Thompson has just gotten out of bed and begins to do jumping jacks. Which storage biomolecule will be his most likely fuel source? [1]
(ii) Briefly describe the three (3) stages of processing these molecules will be subjected to. [6]
(iii) For stage 1 of the above process, write an equation for the reaction including the enzymes used. [2]

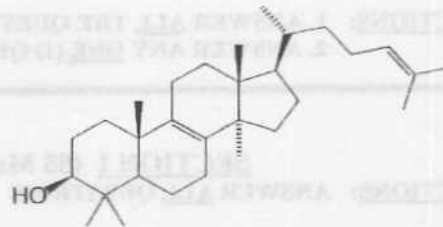
- e) (i) Discuss how pH affects the net charge on an amino acid. [2]
(ii) Briefly explain what is meant by the term "isoelectric point". [3]

Total = 40 marks

2. a) (i) Draw the covalent structure of the tripeptide: *Tyr-Ala-Asp*. [9]
(ii) Write the 1-letter code for each of the amino acid above. [3]
- b) Give an overview of primary and secondary structure in a protein. [8]
- c) (i) Define what is meant by the term "inhibitor"? [2]
(ii) Differentiate between the various types of reversible inhibitors. [6]
(iii) Discuss, with reference to a specific example, how inhibition is utilized in an advantageous manner. [4]
- d)



Structure A



Structure B

- (i) Identify which class of lipids compounds **A** and **B** belong to, state one (1) function of each and identify the three (3) major components of compound A. [7]
- (ii) List and draw the structures of any other two (2) lipids found in mammalian cells. [6]

Total = 45 marks

***** END OF SECTION I *****

SECTION II (15 Marks)

INSTRUCTIONS: ANSWER ANY ONE (1) QUESTION

(Where appropriate, the use of suitable examples and/or structures should be used.)

3. a) List and discuss three (3) factors that may affect the activity of enzymes. [10]
- b) Eicosanoid C is produced in the cell and is able to influence ion transport only in adjacent cells. Draw the structure of a similar compound and list three (3) other functions. [5]

Total = 15 marks

4. Red blood cells can only utilize glucose for energy.
- a) (i) What term is used to describe the metabolic process specific to glucose? [1]
- (ii) Briefly describe each step in this process. [6]
- b) Acetyl coenzyme A is the starting point of a series of reactions that harvest high energy electrons. Name and give an overview of this process. [6]
- c) Based on your knowledge of enzyme nomenclature, state as specifically as possible, what you would expect to be the likely role of phosphoglucose isomerase. [2]

Total = 15 marks

*******END OF PAPER*******

