GREAT ZIMBABWE UNIVERSITY

SIMON MAZORODZE SCHOOL OF MEDICAL AND HEALTH SCIENCES

DEPARTMENT OF BIOMEDICAL SCIENCES: BIOCHEMISTRY

BACHELOR OF SCIENCE/BACHELOR OF SCIENCE HONOURS DEGREE IN BIOMEDICAL SCIENCES

LEVEL 1 SEMESTER 2

FINAL PROFESSIONAL EXAMINATION

MODULE CODE:	BMS102
MODULE NARRATION:	BIOCHEMISTRY
DATE:	November 2024
DURATION:	3 HOURS
EXAMINER	Mr P. Dube

INSTRUCTION TO CANDIDATES:

1. Answer **Five** out of **Eight** questions
2. Each question carries 20 marks
3. Start each question on a new page
4. This question paper consists of 3 printed pages

NB: DO NOT TURNOVER THE QUESTION PAPER OR COMMENCE WRITING UNTIL INSTRUCTED TO DO SO

1. Write an account of the forces that are involved in the folding of proteins. (20 marks)

2.
   a. Describe the steps in gluconeogenesis that are used to bypass the irreversible reactions of glycolysis. (15 marks)
   b. Briefly describe the conditions under which gluconeogenesis is important. (5 marks)

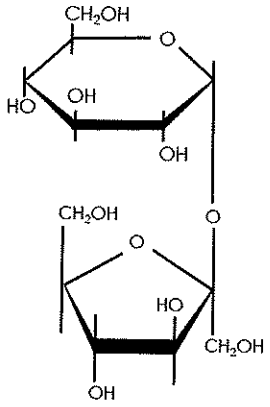
3.
   a. Give an outline of the urea cycle. (10 marks)
   b. Distinguish between:
      (i) ketogenic and glucogenic amino acids (2 marks)
      (ii) chylomicrons and high-density lipoproteins (2 marks)
      (iii) the structure of cholesterol and that of cholic acid (3 marks)
      (iv) peroxisomal and mitochondrial β oxidation. (3 marks)

4.
   a. Write notes on the causes of gout. (5 marks)
   b. Give an outline on how vitamins are classified. (15 marks)

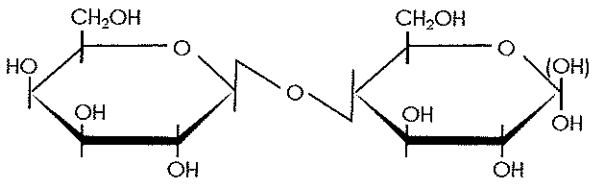
5. Describe the steps that are involved during antigen processing and presentation of the following:
   a. endogenous antigens. (10 marks)
   b. exogenous antigens. (10 marks)

6.
   a. Give a brief account of DNA replication in prokaryotic cells. (8 marks)
   b. Discuss three types of post translational modification of proteins. (12 marks)

7. Shown below are the structures of a sucrose and lactose.

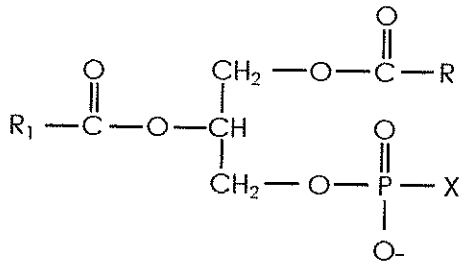


Sucrose



Lactose

a. Explain why there are two forms of lactose whereas there is only one form of sucrose. (4 marks)
b. Describe the molecule whose structure is shown below. (4 marks)



c. Discuss the steps that are involved in the production of monoclonal antibodies. (12 marks)

8.

a. Describe the significance of phosphofructokinase in the metabolism of glucose. (4 marks)
b. Explain how emulsifying agents act. (4 marks)
c. Describe the clinical importance of 2,3-bisphosphoglycerate on oxygen affinity of haemoglobin. (6 marks)
d. Draw the diagrammatic representation of a typical blotting apparatus. (6 marks)

END OF EXAMINATION