UNIVERSITY OF SWAZILAND
Faculty of Health Sciences
Department of Environmental Health Science

BACHELOR OF SCIENCE IN NURSING SCIENCE

SPECIAL EXAMINATION PAPER 2016

TITLE OF PAPER	:	ORGANIC CHEMISTRY AND BIOCHEMISTRY FOR NURSES
COURSE CODE	:	GNS 112
DURATION	:	2 HOURS
MARKS	:	100
INSTRUCTIONS	:	READ THE QUESTIONS & INSTRUCTIONS CAREFULLY
	:	ANSWER **ANY FOUR** QUESTIONS
	:	EACH QUESTION **CARRIES 25** MARKS.
	:	WRITE NEATLY & CLEARLY
	:	NO PAPER SHOULD BE BROUGHT INTO OR OUT OF THE EXAMINATION ROOM.
	:	BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER.

DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR.

QUESTION ONE

a. Explain what is meant by the term 'anticoagulant' and give three examples of anticoagulants. **[6 Marks]**

b. What is the difference between blood serum and blood plasma? **[4 Marks]**

c. Steriods are a class of biomolecules made up of three six-membered carbon rings and one five-membered ring with an aliphatic chain attached on the five carbon ring. Give three examples of steroids and give the function of each example. **[6 Marks]**

d. Explain how antioxidant enzymes function and give three examples of antioxidant enzymes. (use chemical equations in your answer) **[9 Marks]**

QUESTION TWO

a. Write explanatory notes on the following carbohydrates. Include examples in your explanations;

   (i) Simple.

   (ii) Storage.

   (iii) Structural. **[9 Marks]**

b. State four properties of enzymes. **[8 Marks]**

c. Explain how temperature and pH affects the activity of enzymes in biological systems. **[8 Marks]**

QUESTION THREE

a. _____ is the ability of carbon to form long chains with itself therefore creating millions of organic compounds. **[3 Marks]**

b. Organic compounds contain heteroatoms such as H, N, O, S, P and _____. **[3 Marks]**

c. Benzene contains only _____ hybridised carbons. **[4 Marks]**

d. Name the building blocks of proteins and describe their basic chemical structure and properties **[9 Marks]**

e. Give the molecular formulae of a hydrocarbon containing six carbon atoms that is;

(i) A saturated hydrocarbon.

(ii) Cycloalkane.

(iii) An alkene. **[6 Marks]**

QUESTION FOUR

a. Draw structures for the following compounds and show non-bonding valence electrons where they can be found.

i) *m* methylphenol

ii) Ethylpropyl ether

iii) 6-methyl nonanal

iv) 4,5 divinyl octane

v) 2-bromo-4.methoxyhexanal **[10 Marks]**

b. Discuss the nature and importance of lipids in living organisms. **[15 Marks]**

QUESTION FIVE

a. With reference to monosaccharides, explain the following

(i) Condensation.

(ii) Hydrolysis

(iii) Mutarotation **[12 Marks]**

b. Draw structures of the compounds described below and give the IUPAC name for each structure;

(i) An aromatic compound containing one benzene ring and a methyl group which is *ortho* to a bromo group and *meta* to a hydroxyl group. **[4 Marks]**

(ii) A straight chain of eight carbons with two methyl groups on the second carbon, an *iso*propyl group on the fourth carbon and a carbonyl group on the eighth carbon. **[4 Marks]**

(iii) An unsaturated compound, C_3H_6, undergoes a halogenation reaction to produce dichloride product, A. Draw the molecular structure of Product A. **[5 Marks]**

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