CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF DIPLOMA IN PRODCUREMENT AND LOGISTICS, BUSINESS MANAGEMENT, DIPLOMA IN ACCOUNTING AND DIPLOMA IN HUMAN RESOURCE MANAGEMENT AND DIPLOMA IN RISK AND INSURANCE

DIBM 0121: BUSINESS MATHEMATICS 1

STREAMS: DIBM,DPLM,DIAC,DHRM   **TIME: 2 HOURS**

DAY/DATE: WEDNESDAY 4/12/2019   **11.30 A.M – 1.30 P.M**

 INSTRUCTIONS
Answer question one and any other three questions
Do not write on the question paper

QUESTION ONE

(a) Discus the importance of business mathematics in the management of Kenyan commercial enterprises.   [10 marks]

(b) A firm manufacturing two products M & N. The cost of producing 10 units of M and 8 units of N is ksh 1,000. The cost of producing 5 units of M and 6 units of N is ksh 600 . Determine the cost of producing each of the products.   [5 marks]

(c) XYZ company bought a computer for ksh 125,000. The computer depreciates at rate of 25% per annum. Using reducing balance method of depreciation after 5 years. What is the book value of the computer after 5 years.   [5 marks]

(d) The monthly demand of milk in umoja market is modelled by the function   S= 200 +$400^{0.003x}$ where S is the packets sold and x is the number of days after an advertising campaign.

Required :

(i)   What would be the sales 200 days after an advertising campaign.   [2 marks]

(ii)   After how many days to the nearest a whole number will the monthly sales be 700 students.   [3 marks]

(e) A deposit of ksh 50,000 earns interest of 10% per annum compounded monthly for a period of 5 years. What is the accumulated amount at the end of the holding year.

[5 marks]

QUESTION TWO

(a) Explain the following terms as used in set theory .

(i)	Universal set	[2 marks]
(ii)	Subset	[2marks]
(iii)	Null set	[2 marks]

(b) A survey was carried out with an aim of investigating student preference for three laptop brands namely Hp, Dell and Lenovo. The following information was gathered in a survey that involved 2,000 students.

900 students prefer Hp

640 students prefer Dell

400 students prefer Lenovo

300 prefer Hp and Dell

140 prefer Dell and Lenovo

200 prefer Hp and Lenovo

600 prefer none of the three brands.

Required :

(i)	Present the above information in a venn diagram.	[4 marks]
(ii)	How many students prefer a single brand.	[2 marks]
(iii)	How many students prefer all the three brands.	[2 marks]
(iv)	How many students prefer at least two brands.	[2 marks]

(c) ABC company makes a profit of ksh 20,000 on it 1st month. The profit increases by 10% each moth for the next 2 years. What is the total profit in the 16 months period.

[4 marks]

QUESTION THREE

(a) Explain the following terms as used in business mathematics.

(i)	Variable cost	[2 marks]

(ii)   Fixed cost   [2 marks]

(iii)   Break even point   [2 marks]

(iv)   Equilibrium quantity   [2 marks]

(b).   Express technology company manufactures and sells mobile phones. Each mobile phone costs ksh 400 to manufacture and company fixed costs ksh 4,800. The company sells the phone at a price of ksh 2000 each given that x, is the number of units. Determine:

(i) The company's total cost function.   [2 marks]

(ii) The total revenue function   [2 marks]

(iv)   The company's profit function   [2 marks]

(v)   The break even point   [3 marks]

(b) The supply function of commodity Y is given by P=400 -4Q and the price function is given by P= -14Q +500. Where Q is the number of units.

Determine the market equilibrium.   [3 marks]

QUESTION FOUR

(a) Distinguish between ordinary annuity and annuity due.   [2 marks]

(b) James wants to invest in a savings plan that requires a deposit of ksh 10,000 at the end of first year, then ksh 25,000 at the end of 2nd year, 3rd year and fourth year respectively. The plan provides compound interest at 9% per annum. How much will he have accumulated at the end of 4th year?   [6 marks]

(c) Use binomial theorem to expand $(3 -2x)^6$ hence use the expansion of estimate the value of $(0.008)^6$ [6 marks]

(d) Consider the letter BROTHER .

(i)   Assume that all letters are taken at once. How many permutations are possible.

[2 marks]

(ii)   How many arrangements are possible if letter T and H are next to each other.

[2 marks]

(iii)   Assume that four letters are taken at once, How many arrangements are possible.

[2 marks]