

KABARAK



UNIVERSITY

UNIVERSITY EXAMINATIONS

2009/2010 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF BUSINESS

MANAGEMENT AND INFORMATION

TECHNOLOGY

COURSE CODE: BMIT 122

COURSE TITLE: BUSINESS MATHEMATICS

STREAM: Y2S1

DAY: TUESDAY

TIME: 2:00 – 5:00 P.M.

DATE: 23/03/2010

INSTRUCTIONS:

1. Answer question ONE and any other THREE questions
2. Begin each question on a separate page
3. Show your workings clearly

PLEASE TURNOVER

QUESTION ONE (40 MARKS)

- a) Shown that $(p \Rightarrow q) \wedge (\Rightarrow r)$ is a tautology. (5 marks)
- b) Let $A = (0,1,2 \dots 15)$
- i) Find the representations of $(2,4,5,7,11,14)$ as a bit string. (2 marks)
- ii) Write down the set represented by the bit string 1010011011101001 . (2marks)
- c) Find the gradient of the ellipse $x^2 - 3yx + 2y^2 - 2x = 4$ at the point $(1,-1)$. (5 marks)
- d) A business man borrows Ksh 1,000 and repays the loan by yearly instalments of Ksh 100, the first installment paid one year after the loan. After how many years will he be out of the debt, interest being reckoned throughout at 4% per annum? (5 marks)
- e) Given the following information, construct a pie chart. (5 marks)

Student	Marks
Naomi	60
Chebet	46
Kariuki	20
Atieno	18

- f) In an AP the forth term is 13 and the seventh term is 22. Determine
- (i) The first term and the common difference. (4 marks)
- (ii) The value of n if the nth term is 100. (2 marks)
- (iii) The value of m if the sum to m term of the series is the 175. (4 marks)
- g) Two planes leave an airport L at 12.00 noon. The first plane flies due West at a speed of 600Km/h and the second flies on a bearing $N30^{\circ} E$ at a speed of 1000Km/h. calculate how far a part the plane will be at 1.00 PM and the bearing of the second plane from the first at the time. (6 marks)

QUESTION TWO (20 MARKS)

Class intervals	frequency
0-10	5
10-20	15
20-30	33
30-40	65
40-50	76
50-60	69
60-70	49
70-80	35

Calculate:

- (i) Mean (4 marks)
- (ii) Standard Deviation. (4 marks)
- (iii) Median. (4 marks)
- (iv) Mode. (4 marks)
- (v) Variance. (2 marks)
- (vi) Coefficient of variations. (2 marks)

QUESTION THREE (20 MARKS)

- a) For the function $f(x) = -4x + 6x - 20$.
 - (i) Determine the derivative using the first principles. (5 marks)
 - (ii) Determine the instantaneous rate of change in $f(x)$ at $x = 5$ (2marks)
 - (iii) Determine where on the function the slope equals 0 (2 marks)
- b) In a competition two players A and B play 9 games of chess. Player A wins 5 games, player B wins 3 games while on egos a drawn. In the second and final round they decide to play three more games. Find the probability that;
 - (i) A win all the three games. (3 marks)
 - (ii) A and B win on each and the other is drawn. (5 marks)
 - (iii) B wins at least one game. (3 marks)

QUESTION FOUR (20 MARKS)

(a) Differentiate the following

a) $y = \frac{(x-3)^2}{(x+2)^2}$ at $x = 1$. (5 marks)

b) $y = (x^2 - 1)(\sqrt{1+x})$ at $x = 1$ (5 marks)

(b) Find the area of the region bounded by the line $y=4x$ and the curve $y=x^3 + 3x^2$. (5 marks)

(c) Find the value of x for which. (5 marks)

$$\begin{vmatrix} 1 & x & x^2 \\ 1 & 1 & 1 \\ 4 & 5 & 0 \end{vmatrix} = 0$$

QUESTION FIVE (20 MARKS)

a) For purpose of estimating this year's inventory a computer company samples 6 dealers in each case getting figures for both this years and last years.

Inventory last years (X)	Inventory this year(Y)
70	60
260	320
150	230
100	120
20	50
60	60

- (i) Calculate the least squares regression equation for this year's inventory level against year and plot the regression line on a scatter diagram. (8 marks)
- (ii) Calculate correlations coefficient. (4 marks)
- b) Five books are to be from twenty books, which eight are paperback and twelve are hardback. How many selections are possible if at least one paperback book has to be included? (4 marks)

c) Calculate:

$$\lim_{x \rightarrow \infty} \frac{2x^5 - x^3 - 1}{6x^3 + 2x^2 - 7}$$