

KABARAK



UNIVERSITY

UNIVERSITY EXAMINATIONS

2008/2009 ACADEMIC YEAR

**FOR THE DEGREE OF BACHELOR OF BUSINESS
MANAGEMENT AND INFORMATION TECHNOLOGY**

COURSE CODE: BMIT 122

COURSE TITLE: BUSINESS MATHEMATICS

STREAM: Y1S2

DAY: THURSDAY

TIME: 9:00 – 11:00A.M.

DATE: 03/12/2009

INSTRUCTIONS:

- i. Answer Question **One** and any **Other Three** questions*
- ii. All workings leading to answers must be clearly shown*

QUESTION ONE: (Compulsory) (40 Marks)

a) A survey of 400 recently qualified chartered Accountants revealed that 112 joined industry, 120 started practice and 160 joined the firms of practicing chartered accountants as paid accountants as paid assistants. There were 32 who joined service and also did practice; 40 had both practice and assistantship and 20 had both industry and assistantship. There were 12 who did all the three. Determine

- i. Those who could not get any of these
- ii. Those who did only one of these (6 Marks)

b) Solve the following matrix

$$2x + 3y + 4z = 29$$

$$x + y + 2z = 13$$

$$3x + 2y + z = 16 \quad (6 \text{ Marks})$$

c) Write short notes on the following

- i. A set (2 Marks)
- ii. An equation (2 Marks)
- iii. Integration (2 Marks)
- iv. Range (2 Marks)

d) Nakuru Provincial hospital blood bank conducts an annual blood drive to replenish its inventory of blood. The hospital estimates that blood will be donated at a rate $d(t)$ litres per day where $d(t) = 1000 e^{-0.06t}$ where t is the length of blood drive in days. If the goal for the blood drive is 4000 litres, when will the hospital reach its goal? (6 Marks)

e) A sum of Kshs 2,000,000 is invested in a savings account at a rate of 8% p.a. if all the interest is re-invested, what will be the value of the investment after 8 years if interest is compounded

- i. Annually (2 Marks)
- ii. Semi-annually (2 Marks)
- iii. Quarterly (2 Marks)

f) Given that

$$U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16\}$$

$$A = \{1, 2, 3, 4, 5, 6, 12, 13\}$$

$$B = \{3, 4, 5, 7, 9, 10, 15\}$$

$$C = \{2, 3, 4, 6, 8, 10, 12, 13\}$$

Write down the following sets

- i. A'
- ii. B'

- iii. C'
- iv. $(A')'$
- v. $(A \cup B)'$
- vi. $(A \cap B)'$
- vii. $A' \cup B'$
- viii. $A \Delta B$ (8Marks)

QUESTION TWO (20 Marks)

a) Given the following matrix, determine its determinant using the co-factor method

$$A = \begin{bmatrix} 1 & 2 & 7 \\ 4 & 9 & 2 \\ 6 & 0 & 5 \end{bmatrix}$$

(6 Marks)

b) Find the limits of the following

$$\lim_{n \rightarrow \infty} \frac{7n^3 - 8n^2 + 10n - 7}{8n^3 - 9n^2 + 5} \quad (2 \text{ Marks})$$

c) Suppose that X is normally distributed and has a mean of 10 and standard Deviation of 2. What is the probability that it assumes a value between 7 and 14? (4 Marks)

d) Discuss the properties of a good estimator. (8 Marks)

QUESTION THREE (20 Marks)

a) Using the following information regarding the marks scored by students in BMIT 122 exam determine mean, median, and mode of the grouped data

Class	frequency
20 – 29	4
30 – 39	13
40 – 49	9
50 – 59	18
60 – 69	7
70 – 79	2

(10 Marks)

b) A basket of 8 items is known to have 5 white and 3 red pens. A random sample of these pens is chosen, assuming that it is not replaced, what is the probability that the sample will have

- i. All the three white pens
 - ii. Two white and one red pen
 - iii. All the three red pens
- (10 Marks)

QUESTION FOUR (20 Marks)

a) A manufacturer has found that if he wants to increase his output he must lower his price. His total revenue R from an output x is given by $R = x(148-x)$. his

production costs are Kshs. 1000 and Kshs. 36 per unit variable and the total cost $C = 1,000 + 36x$. Required, find

- i. The output that would maximize the revenue
 - ii. The maximum total revenue
 - iii. The output that will maximize profit (6 Marks)
- b) Negate the following statements
- i. Martha is hardworking
 - ii. All professors are absent minded (2 Marks)
- c) Differentiate the following using the first principles $2x^2 + 6x + 8$ (4 Marks)
- d) Show that $(A \cup B)^c = A^c \cap B^c$ (4 Marks)
- e) Investigate the continuity of the function $y = 5x$ (4 Marks)

QUESTION FIVE (20 Marks)

a) An enquiry into 1,000 candidates who failed KCSE exam revealed the following: 658 failed in aggregate, 372 failed in group I, 590 failed in group II; 168 failed in the aggregate and in group I, 434 failed in the aggregate and in group II, 126 failed in both groups.

Required: Determine how many candidates failed in

- i. All the three
 - ii. In aggregate but not in group II
 - iii. Group I but not in aggregate
 - iv. Group two but not in group I
 - v. Aggregate or group II but not in group I
 - vi. Aggregate but not in group I and II (12 Marks)
- b) Write short notes on the following
- | | |
|-----------------|----------------------|
| a. Trigonometry | c. Parameter |
| b. Trial | d. Random experiment |
- (8 Marks)