MURANG'A COLLEGE OF TECHNOLOGY
END TERM II
MATHEMATICS
CLASS: EE/P/12C B
TIME: 2½ HOURS

ATTEMPT ALL QUESTION

Q1. (a) Express

(i) 5640
(ii) 180325 as a product of prime factors. (4 marks)

(b) The length and breadth of a rectangular room are 15m and 12m respectively. If each of these measurements is liable to a 2% error, calculate the absolute error in the area calculate from these values. (8 marks)

(c) Given T = 64 and R = $\frac{1}{16}$

(i) Calculate ¼ $R^{-¼}$

(ii) Give all the possible values of (2TR) ½ (8 marks)

Q2. (a) Simplify

$$\frac{512^{4/3} \times 27^{-2/3}}{128^{2} \times 9^{-2}}$$ (4 marks)

(b) A bus leaves Murang'a at 2337 hrs and travels for 50 minutes to its next stop at Ruiru a distance of 60km

Calculate

(i) The time at which the bus arrives at Ruiru
(ii) Its average speed in Km/h. (8 marks)

(c) (i) Evaluate without the use of tables/calculator for x

2 log (x-5) = 4 log 2.

(ii) Solve $^1/_6 (5x + 3 - ^1/_3 (2x - 7) = ^3/_8$ (8 marks)

Q3 (a) (i) $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ Find the inverse of the matrix A

(ii) Use matrix method to solve for m and n

$$6m + 7n = 5$$
$$5m + 3n = 7$$ (8 marks)

(b) Solve

(i) $2^{x-3} \times 8^{x^2+2} = 128$ (4 marks)

(ii) $3 \log_{10}(x - 2) = 4.7124.$

(iii) $3(7)^{2x} = 4(6)^{x-3}$ (4 marks)

Q4 (a) A tailor buys cloths of three different type : Nylon, wool and cotton. They cost sh.25, sh.50 and sh sh.15 per metre respectively and the tailor buys 30m of nylon 36m of wool and 54m of cotton. Calculate the total cost of the cloth using row and column matrices. (8 marks)

(b) Find the inverse of the matrix.

$$\begin{pmatrix} 2 & -1 \\ 3 & 2 \end{pmatrix}$$ and use your result to solve the following simultaneous equations

(i) $2x - y = 2$
$x + 2y = 11$

(ii) $6x - 3y - 7 = 0$
$3x + 6y - 1 = 0$ (12 marks)

Q5 (a) Solve: $7x - 4y + 6Z = 3$
$3x + 6y - Z = 6$
$4x - 2y + 5Z = 7$ (10 marks)

(b) Give $A = \begin{pmatrix} 2 & 3 & -1 \\ 0 & -2 & 5 \\ 1 & 2 & 4 \end{pmatrix}$ $B = \begin{pmatrix} 5 & 0 \\ 0 & 4 \\ 2 & 3 \end{pmatrix}$

$C = \begin{pmatrix} 4 & -3 & 5 \\ 2 & -1 & -9 \\ -5 & 6 & 8 \end{pmatrix}$

Find (i) AC
(ii) AB.
(iii) A - C (10 marks)