MIB(S).I/10.194

M.I.B. DEGREE I SEMESTER (SUPPLEMENTARY) EXAMINATION NOVEMBER 2010

SMI 2104 QUANTITATIVE METHODS

Time : 3 Hours   Maximum Marks : 50

(All questions carry **_EQUAL_** marks)

(5 x 10 = 50)

I.   A.   (a)   Distinguish between a symmetric matrix and a skew symmetric matrix. Partition the following matrix to a symmetric and a skew symmetric matrix.

$$A = \begin{bmatrix} 1 & 2 & -1 \\ 0 & 3 & 4 \\ -1 & -1 & 1 \end{bmatrix}$$

            (b)   Explain the conditions for a function $y = f(x)$ to have maximum

and minimum values. Show that the total revenue $R = 20 - x^2$ will be maximum when output $x = 10$.

OR

   B.   (a)   Define the Adjoint of a matrix. For any square matrix A, show that

$A(Adj\ A) = |A| I.$

            (b)   Solve the following system of simultaneous equations using Cramer's rule :

$$3x_1 + 4x_2 - x_3 = 5$$
$$x_1 + 4x_2 + 2x_3 = 6$$
$$2x_1 + 3x_2 + x_3 = 4$$

II.   A.   (a)   Distinguish between arithmetic mean, geometric mean and harmonic mean stating the advantages and disadvantages of each.

            (b)   For the following data calculate the GM :

Size	5	8	10	12	14	16
Frequency	2	3	4	5	4	2

OR

   B.   (a)   Explain briefly the various measures of dispersion and their properties.

            (b)   The marks obtained by 50 students in an examination is given below. Calculate the mean marks and the standard deviation.

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
No. of students	2	4	5	7	9	5	8	10

III.   A.   (a)   Define correlation. Explain Karl Pearson's coefficient of correlation. Illustrate spurious correlation with suitable examples.

            (b)   The data on price and quantity demanded of a commodity for the past five years is given below. Calculate the coefficient of correlation and hence comment on the relation.

(P.T.O.)