



MBE-003-004104

Seat No. _____

B. Sc. (I.T.) (Sem. I) (CBCS) Examination

November / December – 2016

Foundation of Mathematics & Statistics

(Old Course)

Faculty Code : 003

Subject Code : 004104

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instruction : Give the answer in your answer sheet.

1 (1) What is the size of the matrix (a, b, c) ? **20**

(2) If $A = \begin{bmatrix} 5 & 2 \\ 3 & 2 \end{bmatrix}$ then $|A| =$ _____.

(3) $A' + B' =$ _____

(4) For a symmetric matrix which condition is true ?

(5) $\Delta Y_1 =$ _____.

(6) Backward difference operator is called as

(7) $\Delta Y_0 =$ _____.

(8) The general formula for N-R method.

(9) In Gauss elimination method coefficient matrix of given system of equations are converted into _____.

(10) $A^{-1} =$ _____

(11) An exponential curve $y =$ _____.

(12) $b_{yx} \times b_{xy} =$ _____.

(13) If $b_{yx} = 0.8$, $b_{xy} = 0.2$ then $r =$ _____

(14) In a rank correlation method $\sum d^2 = 0$, then
 $r =$ _____.

(15) The regression coefficient x on y is denoted by ?

(16) $y = 6.4 + 3.3(x - 1998)$, forecast y when the year
 $x = 2000$?

- (17) The value of r^2 is between ?
 (18) What is the midvalue of the class 20-30 ?
 (19) Least Cost Method is also known as
 (20) A st. line $y = \underline{\hspace{2cm}}$.

2 (a) Any three :

6

- (1) Define : Row matrix, Null matrix

(2) If $A = \begin{bmatrix} 2 & 1 & 0 \\ 3 & 2 & 1 \\ 1 & 0 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 0 & 1 & 2 \\ 3 & 1 & 0 & 5 \end{bmatrix}$ find AB

- (3) Prove that $A(BC) = (AB)C$

If $A = \begin{bmatrix} 2 & 6 \\ 7 & 2 \end{bmatrix}$, $B = \begin{bmatrix} -3 & 5 \\ 0 & 8 \end{bmatrix}$, $C = \begin{bmatrix} 4 & 7 \\ 9 & 5 \end{bmatrix}$

(4) $A = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$ find adj A

- (5) Using modified Euler's method, find $y(0.1)$ given
 that $\frac{dy}{dx} = x + y$ and $y(0) = 1$, $h = 0.1$

- (6) Write use of Interpolation

(b) Any three :

9

- (1) Evaluate $\sqrt{20}$ using N-R method
 (2) Find the root of the equation $x^2 + 2x - 2$ using
 bisection method correct of two decimal places.
 (3) Find $f(1.5)$

x :	1	2	3	4
f(x):	3	7	13	21

- (4) Use R-K 4th order method to find $Y(0.2)$ given
 that $y' = x + y$ and $y(0) = 1$, $h = 0.2$
 (5) Explain : Simpson's 1/3 rule
 (6) Explain : Gauss-elimination method.

- (c) Answer any two : 10
- (1) Explain : Gauss-Jordan method.
 - (2) Explain : Trapezoidal Rule
 - (3) Explain : Euler's method
 - (4) Explain : Langrage's method
 - (5) Using R-K 2nd order method. Find y (0.1) given that $y' = xy + y^2$, $y(0)=1$, $h = 0.1$

- 3 (a) Any three : 6
- (1) Explain : Scatter diagram method.
 - (2) Explain : Uses of Regression
 - (3) Explain : Simplex method
 - (4) State the uses of TP.
 - (5) Find r

x :	0	1	2	3	4
y :	5	7	8	9	11

- (6) Find byx

x :	3	4	5	7	8
y :	11	14	17	23	26

- (b) Any three : 9
- (1) Define : Pie-diagram.
 - (2) Explain : North-West Corner Method.
 - (3) Explain : Properties of regression.
 - (4) Find y when $x = 10$ using appropriate regression line

$$\bar{x} = 10, \bar{y} = 12, s_x = 4, s_y = 5, r = 6.8$$

- (5) Fit a st-line to the following data:

x :	1	3	5	7	9
y :	5	7	10	11	17

- (6) Find rank correlation coefficient :

x :	10	12	8	9	13	17	14
y :	100	102	99	103	107	101	98

(c) Any two :

10

(1) Solve the following LPP by graphical method

$$Z_{\max} = 40x + 45y, \text{ Subject to}$$

$$x+2y \leq 60, 3x + 2y \leq 120, x, y \geq 0$$

(2) Using simplex method solve the following LPP

$$Z_{\max} = 30x + 40y, \text{ Subject to}$$

$$60x + 120y \leq 12000,$$

$$8x + 5y \leq 600,$$

$$3x + 2y \leq 500,$$

$$x, y \geq 0$$

(3) Solve the following TP using NWCM

	Destination				
Origin	1	2	3	4	Available
O ₁	11	13	17	14	250
O ₂	16	18	14	10	300
O ₃	21	24	13	10	400
Required	200	225	275	250	

(4) Find $y = a + bx + cx^2$

Year	1987	1988	1989	1990	1991
Sales	5	7	4	9	12

(5) Explain : Vogel's Method.
