

B.B.A. Semester - 2 (NEP-2020) Examination

JUNE – 2024

Business Mathematics (Multidisciplinary Course)

Time: 2:00 Hours

Marks: 50

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1(A) Explain : (i) Transpose of a matrix, (ii) Unit matrix, (iii) Inverse of a matrix (05)
(iv) Diagonal Matrix (v) Scalar Matrix

Que.1(B) If $A = \begin{bmatrix} 2 & 5 & 7 \\ 1 & 2 & 3 \end{bmatrix}$ $B = \begin{bmatrix} 3 & 2 & 1 \\ 4 & 7 & 9 \\ 5 & 2 & 4 \end{bmatrix}$ then find AB and BA If possible (05)

OR

Que.1(A) If $A = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$ then prove that $A^3 = 4A$ (05)

Que.1(B) Find X and Y using matrix inversion method. (05)
 $3x - y = 1$, $2x + y = 4$

Que.2(A) Write rules of determinant (05)

Que.2(B) Prove that $\begin{vmatrix} (x-1)^2 & x^2+1 & x \\ (y-1)^2 & y^2+1 & y \\ (z-1)^2 & z^2+1 & z \end{vmatrix} = 0$ (05)

OR

Que.2(A) Prove that $\begin{vmatrix} 1-x & 1 & 1 \\ 1 & 1-x & 1 \\ 1 & 1 & 1-x \end{vmatrix} = x^2(3-x)$ (05)

Que.2(B) Solve using Cramer's method (05)
 $3(x-1) + 3(y-1) = 15$
 $3(x-1) + 4(y+1) = 21$

Que.3 Find Limits (any five) (10)

$$\begin{array}{ll} (1) \lim_{x \rightarrow 4} \frac{x^2-5x+4}{x^2-2x-8} & (4) \lim_{n \rightarrow \infty} \frac{(2n+1)(n+1)(n-1)}{n(n+2)(n+3)} \\ (2) \lim_{x \rightarrow -1} \frac{x^7+1}{x+1} & (5) \lim_{n \rightarrow \infty} \frac{\sum n}{n^2} \\ (3) \lim_{x \rightarrow 2} \frac{\sqrt{x}+7-3}{x-2} & (6) \lim_{x \rightarrow 0} \frac{8^x-5^x}{x} \end{array}$$

Que.4 Find $\frac{dy}{dx}$ (any four) (10)

$$\begin{array}{ll} (1) y = e^{3x+5} & (4) y = e^x \cdot \log(x) \\ (2) y = \log(4x+7) & (5) y = (2x-4)(5x+7) \\ (3) y = x^3 + 6x^2 + 11x + 7 & (6) y = \frac{3x-4}{4x+5} \end{array}$$

Que.5(A) Define (i) simple Interest (ii) compound Interest (iii) Effective rate (05)

Que.5(B) At what % rate of Simple Interest a sum will be triple itself in 12 years? (05)

OR

Que.5(A) Define (i) Annuity (ii) present value of Annuity (iii) Sinking Fund (05)

Que.5(B) If Rs.30,000 is invested at 6% interest per annum paid semiannually, what is the value after 4 years. (05)
