

B.B.A. Semester - 2 (CBCS) Examination**June/July-2022 [OLD COURSE]****ADVANCE TECHNIQUES OF BUSINESS MATHEMATICS (ELECTIVE)****Time: 2:30 Hours****Marks: 70****Instructions:**

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

Q.1 (A) Prove that $\begin{vmatrix} b+c & a & a \\ b & c+a & b \\ c & c & a+b \end{vmatrix} = 4abc$ (07)

(B) Explain: Rules of determinants. (07)

OR

Q.1 (A) Prove that $\begin{vmatrix} x+1 & 1 & 1 \\ 2 & x+2 & 2 \\ 3 & 3 & x+3 \end{vmatrix} = x^2(x+6)$

(B) Solve the equation, using cramer's rule.

$$X+2y+3z=14$$

$$2x+y+z=7$$

$$5x+2y+z=12$$

Q.2 (A) Explain: (1) Transpose of a matrix (2) Symmetric matrix (07)

(3) Inverse of a matrix

(B) If $2A-B = \begin{bmatrix} 8 & 11 \\ 8 & 7 \end{bmatrix}$ and $3A-B = \begin{bmatrix} 3 & -2 \\ 7 & -4 \end{bmatrix}$ then find $4A-3B$. (07)

OR`

Q.2 (A) If $A = \begin{bmatrix} 6 & 3 \\ 4 & 5 \end{bmatrix}$ then find A^{-1} and verify that $AA^{-1}=I_2$.

(B) Solve the following system of two liner equations by using inverse matrix method.

$$2x+3y = 13, 3x + 2y = 12$$

Q.3 Find the following limits. (any four) (14)

(1) $\lim_{n \rightarrow \infty} \frac{\Sigma n}{(n+1)(n+2)}$

(2) $\lim_{x \rightarrow -} 3 \frac{2x^2+9x+9}{2x^2+7x+3}$

(3) $\lim_{x \rightarrow -} 3 \frac{x^2-9}{x^3+27}$

(4) $\lim_{n \rightarrow \infty} \frac{4\Sigma n^3}{(n+4)(n+3)(n+2)(n+3)}$

(5) $\lim_{x \rightarrow 4} 4 \frac{x^2-5x+4}{x^3-2x-8}$

(6) $\lim_{x \rightarrow 4} 4 \frac{\sqrt{x}-2}{x-4}$

Q.4 Find $\frac{dy}{dx}$ (any four) (14)

(1) $y = \frac{3^x}{x^3}$

(2) $\log \left(\frac{x+1}{x-1} \right)$

(3) $x^y = y^x$

(4) $y=e^{3x}.\log(5x)$

(5) $y = (2x-4)(5x+7)$

(6) $x = x^e .e^x .e^e$

Q.5 (A) present value of an annuity. (07)

(B) What is the present value of Rs. 13,440 to be received after $2\frac{1}{2}$ years at 12% compounded quarterly? (07)

OR

Q.5 (A) If Rs. 8,000 amounts to Rs. 9,600 after 4 years, find the simple interest rate.

(B) Explain: sinking fund.
