

B.B.A. Semester - 2 (CBCS) Examination

March/April- 2019 (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.

Que-1 (A) Define following. (05)

- (1) Square Matrix
- (2) Identify Matrix
- (3) Transpose of a Matrix
- (4) Scalar Matrix
- (5) Orthogonal Matrix

(B) If $A = \begin{pmatrix} 0 & 1 & 2 \\ 2 & -3 & 0 \\ 1 & 1 & -1 \end{pmatrix}$ Then find A^{-1} (05)(C) If $A = \begin{pmatrix} 3 & 2 \\ 4 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} a & b \\ 3 & 5 \end{pmatrix}$ (04)Find a and b such that $AB = BA$ Also find $3A+5B$.

OR

Que-1 (A) Define Inverse of a matrix and write its properties. (05)

(B) Find matrix x and y if $x + y = \begin{pmatrix} 7 & 10 \\ 2 & 5 \end{pmatrix}$ and $x - y = \begin{pmatrix} 3 & 0 \\ 0 & 3 \end{pmatrix}$ (05)

(C) Solve equations using matrix inversion method. (04)

$$x + y + z - 7 = 0$$

$$x + 2y + 3z - 16 = 0$$

$$x + 3y + 4z - 22 = 0$$

Que-2 (A) Write Rules of determinant. (05)

(B) Prove that $\begin{vmatrix} x^3 & y^3 & z^3 \\ x^2(x+y) & y^2(y+z) & z^2(z+x) \\ x^2y & y^2z & z^2x \end{vmatrix} = 0$. (05)

(C) Solve equation using Cramer's rule (04)

$$2x + 5y = 2 \times y : 4x + 5y = 3 \times y.$$

OR

Que-2 (A) Write any one Rule of determinant and prove it. (05)

(B) Prove that $\begin{vmatrix} (a-1)^2 & (b-1)^2 & (c-1)^2 \\ a^2+1 & b^2+1 & c^2+1 \\ a & b & c \end{vmatrix} = 0$. (05)

$$(C) \text{ Solve } \begin{vmatrix} a+1 & a+2 & 3 \\ 3 & a+2 & a+1 \\ a+1 & 2 & a+3 \end{vmatrix} = 0. \quad (04)$$

Que-3 Find Values of (any five) (14)

$$(1) \lim_{x \rightarrow 0} \frac{\sqrt{2+x} - \sqrt{2}}{x}$$

$$(2) \lim_{x \rightarrow 0} \frac{x^2 - 16}{\sqrt{x^2 + 9} - 5} \quad ($$

$$(3) \lim_{x \rightarrow 0} \frac{x^{10} - 1024}{x^5 - 32} \quad ($$

$$(4) \lim_{x \rightarrow 0} \frac{4x^2 + 5x + 6}{3x^2 + 4x + 5} \quad ($$

Que-4 Differentials w. r. t. x. (any five) (14)

$$(1) \left(x + \frac{2}{x+3} \right) \left(\frac{2x-1}{x^2 + 3x + 2} \right) \quad (5) \left(\frac{4x+7}{4x-7} \right)^4$$

$$(2) xy + 3x + 5y - 1 = 0 \quad (6) y = \frac{(x^2 + x^{-2})(x^4 + x^{-4})}{x^3}$$

$$(3) \log(x e^x) \quad (7) \log\left(\frac{2x+3}{3x+7}\right)$$

$$(4) (x^3 + 11x^2 + 90)^{7/2} \quad (8) f(x) = \frac{3 + \frac{3}{x}}{3 + \frac{3}{x}} \text{ find } f'(3)$$

Que-5 (A) Mr. X deposited Rs.12,000 in a firm out 8% rate of compound interest. For 5½ year. (05)
Interest is calculated half yearly. What amount of compound interest will he get on maturity.

(B) Anaya invests some amount at 12% compound interest. Interest of 5 year becomes 19058. (05)
Find amount she deposited.

(C) What is the present value of Rs.13,440 to be received after 2½ year at 12% compounded (04)
quarterly.

OR

Que-5 (A) Explain: (05)

(1) Sinking Fund.

(2) Annually

(B) Find minimal rate of interest when the interest is payable quarterly which is equivalent to (05)
effective rate of 12.55% per annum.

(C) In how many years will a sum be doubled at compound rate of interest of 12% $\left(\frac{1}{2^{6.13}} = 1.12\right)$ (04)
