

B.B.A. Semester - 2 (CBCS) Examination**March/April- 2018****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) State the properties (rules) of determinants. (07)

(B) Prove that
$$\begin{vmatrix} b+c & c+a & a+b \\ a+b & b+c & c+a \\ c+a & a+b & b+c \end{vmatrix} = 2 \begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$$
 (07)

OR

Que-1 Solve by Cramer's rule (14)

(i) $3x+y=5xy, -4x+3y=5xy$

(ii) $\frac{x}{3} + \frac{y}{2} = 4, \frac{3x}{2} + \frac{y}{4} = 10$

Que-2 (A) Define the following: (08)

- (1) Transpose of a matrix (2) Symmetric matrix
(3) Inverse of a matrix (4) Unit matrix

(B) If $2A - B = \begin{bmatrix} 8 & 11 \\ 8 & 7 \end{bmatrix}$ and $3A - B = \begin{bmatrix} 17 & 19 \\ 12 & 8 \end{bmatrix}$, find A and B (06)

OR

Que-2 Solve the following equations using inverse of matrix method:

$x + y + z = 3, 2x + y - z = 3, x - y + z = 9.$

Que-3 Attempt any four. (14)

(1) $\lim_{x \rightarrow \infty} \left(1 + \frac{1}{2x}\right)^x$ (2) $\lim_{x \rightarrow \infty} \frac{\sum n}{(n+1)(n+2)}$

(3) $\lim_{x \rightarrow 3} \frac{\sqrt{x+2} - \sqrt{5}}{x-3} x \neq 3$ (4) $\lim_{x \rightarrow 1} \frac{x^7-1}{x-1} x \neq 1$

(5) $\lim_{x \rightarrow 0} \frac{7^x - 5^x}{x}$ (6) $\lim_{x \rightarrow 0} \frac{e^{2x} - 1}{x} x \neq 0$

Que-4 (A) Obtain $\frac{d}{dx}(x^n)$ using first principles. (07)

(B) Find $\frac{d}{dx}(e^x)$ and $\frac{d}{dx}(\log x)$ using definition. (07)

OR

Que-4 (A) Find $\frac{dy}{dx}$ if $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$. (07)

(B) Find $\frac{dy}{dx}$ if $x^m y^n = (x + y)^{m+n}$ (07)

Que-5 (A) What is Annuity? Find the formula for annuity. (07)

(B) Rs.10,000 is invested at 6% compounded (i) half yearly (ii) quarterly. Find the amount. (07)

OR

Que-5 (A) Explain : Compound Interest. (07)

(B) Explain : Sinking Fund. (07)
