



NBJ-161100010203 Seat No. _____

B. B. A. (Sem. II) (CBCS) Examination

April/May – 2017

**Advance Techniques of Business Mathematics
(New Course)**

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

[Total Marks : 70

- Instructions :** (1) Attempt all the questions.
(2) Figures to the right indicate marks of each question.

- 1 (a) Explain : Rules of Determinants. 7
(b) Solve the equations, using Cramer's Rule 7

$$4x + 10y = 2xy, \quad 5x + 16y = 3xy$$

OR

- 1 (a) If $\begin{vmatrix} 16 & 8 & 26 \\ 6 & 3 & 9 \\ 2 & 1 & 4 \end{vmatrix} = \begin{vmatrix} 1 & 2 & 5 \\ 2 & k & 0 \\ 7 & 14 & 9 \end{vmatrix}$ find the value of k. 7

- (b) Prove that $\begin{vmatrix} x+a & b & c \\ c & x+b & a \\ a & b & x+c \end{vmatrix} = x^2(x+a+b+c)$. 7

- 2 (a) Explain : Unit matrix, Skew-symmetric matrix, Adjoint matrix. 7

- (b) If $A = \begin{bmatrix} 1 & 0 \\ 3 & -2 \end{bmatrix}$, $AB = \begin{bmatrix} 3 & 1 \\ 5 & 1 \end{bmatrix}$ find Matrix B. 7

OR

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[Contd...

2 Using inverse matrix solve the following equations : **14**

$$2x - 3y + z = 3, x + y - 2z = -1, 3x - 2y + 2z = 8$$

3 Attempt any four : **14**

$$(1) \lim_{x \rightarrow -3} \frac{x^3 + x^2 - 2x + 12}{x^3 + 6x^2 + 11x + 6} \quad (2) \lim_{x \rightarrow 0} \frac{\sqrt{x^2 + x + 4} - 2}{1 - \sqrt{1 + x}}$$

$$(3) \lim_{n \rightarrow \infty} \frac{\sum n^2}{(n^2 + 2)(n + 7)} \quad (4) \lim_{x \rightarrow 0} \frac{2^{4x} - 3^{2x}}{x}$$

$$(5) \lim_{n \rightarrow \infty} \left(\frac{n-2}{n+3} \right)^n \quad (6) \lim_{x \rightarrow 1} \frac{x^{7/3} - 1}{x^{2/3} - 1}$$

4 Attempt any four, find dy/dx : **14**

$$(1) y = \frac{1+x}{1+x^2} \quad (2) y = x^2 e^x \cdot \log x$$

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

$$(5) xy + x + y - 2 = 0 \quad (6) y = \left(x + \frac{2x+3}{x+2} \right) \left(x + \frac{4x+10}{x+3} \right)$$

5 (a) Explain : Compound Interest. **7**

(b) Explain : Present value of an Annuity. **7**

OR

5 (a) Explain : Sinking Fund. **7**

(b) At what percent rate of simple interest a sum will **7**
double itself in 25 years ?