DL-010-001207 Seat No. _____

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

March – 2022

Business Mathematics : Paper - 207

(Old Course)

Faculty Code : 010

Subject Code : 001207

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions :

(1) Attempt all the questions.

(2) Marks are indicated on right side.

1 (a) Define the following with example column matrix, square matrix, Unit matrix. **7**

(b) If $A=\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix}$ prove that $AA^{-1}=I_2$. **7**

OR

1 (a) State the rules of a determinant. **7**

(b) Solve the following equations by Cramer's method : **7**

$2x + y - 4 = 0, \quad x + 3y - 7 = 0.$

2 Find $\frac{dy}{dx}$ (any four) **14**

(1) $y=\left(x^2+1\right)(x+1)$

(2) $y=(2x+3)^5$

(3) $y = x \log x$

(4) $y = \dfrac{x^2 - 1}{x^2 + 1}$

(5) $y = e^{3x+1}$

(6) $y = \left(\sqrt{x} - \dfrac{1}{\sqrt{x}}\right)\left(\sqrt{x} + \dfrac{1}{\sqrt{x}}\right)$

3 Evaluate : (any four) **14**

(1) $\int 2x + \dfrac{3}{x} + 4e^x dx$

(2) $\int e^{3x+1}\, dx$

(3) $\int \dfrac{2x+3}{x^2+3x+1} dx$

(4) $\int \left(x^2 - 5x + 6\right)\left[\dfrac{3}{x-2} - \dfrac{2}{x-3}\right] dx$

(5) $\int x\, e^x\, dx$

(6) $\int \left(x - \dfrac{1}{x}\right)\left(x + \dfrac{1}{x}\right) dx$

4 (a) If $Z = x^2 + y^2$ then prove that $x \dfrac{\partial z}{\partial x} + y \dfrac{\partial z}{\partial y} = 2Z.$ **7**

(b) If $Z = x^2 + 2xy + y^2$ then prove that $\dfrac{\partial^2 z}{\partial x^2} = \dfrac{\partial^2 z}{\partial y^2}.$ **7**

OR

4 (a) Obtain maximum and minimum values of **7**

$y = x^3 - 9x^2 + 24x + 2.$

(b) If $y = x \log x$ prove that $x^2 \dfrac{d^2y}{dx^2} - x \dfrac{dy}{dx} + y = 0.$ **7**

5 Explain : 14

(1) Simple interest and compound interest

(2) Annuity.

OR

5 Find the compound amount of Rs. 2,000 for 2 years at 10% converted (1) Annually (2) Semi annually (3) Quarterly. 14
