DCB-19080001020602 Seat No. _____

B. Com. (Sem. II) (CBCS) (W.E.F. 2019) Examination

July - 2022

Business Mathematics - 2

(New Course)

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

Instruction : All the questions are compulsory.

1 (a) Write Rules of Determinants. **10**

(b) State the difference between Matrix and Determinants. **5**

(c) Solve by using Crammer's method : **5**

$4x + 3y - 12 = 0$

$4x - 9y - 108 = 0$

OR

1 (a) Find value of x **5**

$$\begin{vmatrix} 4 & 5 & -7 \\ -2 & x & 6 \\ 1 & x & 1 \end{vmatrix} = 43$$

(b) Prove that **10**

$$\begin{vmatrix} x+a & b & c \\ c & x+b & a \\ a & b & x+c \end{vmatrix} = x^2(x+a+b+c)$$

(c) Prove that **5**

$$\begin{vmatrix} a & a & a \\ a & b & b \\ a & b & c \end{vmatrix} = a(a-b)(b-c)$$

2 (a) Find Matrix A and B if, $2A - B = \begin{bmatrix} 8 & 11 \\ 8 & 7 \end{bmatrix}$ and **5**

$3A - B = \begin{bmatrix} 17 & 19 \\ 12 & 8 \end{bmatrix}$.

(b) Prove that **10**

(1) $(AB)^T = B^T A^T$

(2) $Adj(AB) = (Adj(B))(Adj(A))$ for, $A = \begin{bmatrix} 1 & 4 \\ 3 & 2 \end{bmatrix}$ and

$B = \begin{bmatrix} -1 & 2 \\ 3 & 5 \end{bmatrix}$.

(c) If $A=\begin{bmatrix}1 & -1\\ -1 & 1\end{bmatrix}$, $B=\begin{bmatrix}2 & -1\\ -1 & 0\end{bmatrix}$ and $C=\begin{bmatrix}-1 & 2\\ 0 & 1\end{bmatrix}$ find $(A+B+C)$. **5**

OR

2 (a) Solve by using Matrix **15**

$3x+5y+6z=4$

$x+2y+3z=2$

$2x+4y+5z=3$

(b) Find x **5**

$$[x\ \ 4\ \ -1]\begin{bmatrix}2 & 1 & 0\\ 1 & 0 & 2\\ 0 & 2 & 4\end{bmatrix}\begin{bmatrix}x\\ 4\\ -4\end{bmatrix}=0$$

3 Find the value : (any **three**) **15**

(1) $\lim\limits_{x\to 0}\dfrac{\left(\sqrt{1+x}-1\right)}{x}$

(2) $\lim\limits_{x\to 4}\dfrac{\left(x^2-3x-4\right)}{x^2-2x-8}$

(3) $\lim\limits_{x\to -\frac{1}{3}}\dfrac{\left(3x^2+7x+2\right)}{9x^2-1}$

(4) $\lim\limits_{x\to 0}\dfrac{1}{x}\left[\dfrac{2x+9}{x+3}-\dfrac{3}{1}\right]$

(5) $\lim\limits_{x\to 0}\dfrac{3^{2z}+2^{3x}-2}{x}$

(6) $\lim\limits_{x\to \infty}\dfrac{2x^2+7x+5}{4x^2+3x-1}$

4 (a) Prove that by using Mathematical induction **8**

$$2+5+8+.....+(3n-1)=\frac{n(3n+1)}{2}$$

(b) Find sum of **7**

$3\cdot 8+5\cdot 11+7\cdot 14+...n$ terms.

OR

4 (a) Find sum of **7**

$T_n=3n^2+2n$

(b) Find sum of **8**

(1) $7^2+8^2+9^2+.....+20^2$

(2) $11^3+12^3+.....+20^3$.