TDC (CBCS) Even Semester Exam., 2019

COMMERCE

(2nd Semester)

Course No. : BCPDSC–202T

(Business Math and Statistics)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

UNIT—I

1. Answer any *two* of the following questions : 2×2=4

(a) Define matrix.

(b) What do you mean by inverse of a matrix?

(c) Name different types of matrix.

2. *(a)* Given $A = \begin{bmatrix} 1 & -2 & 4 \\ 0 & 2 & 1 \\ -4 & 5 & 3 \end{bmatrix}$

Compute Adj A. 4

(b) If

$$A=\begin{bmatrix}1 & 0 & 0\\ 4 & 2 & 3\\ 2 & 0 & 1\end{bmatrix}$$

Find $A^2 - A - I$. 6

OR

3. (a) Using matrices, solve the following equation : 6

$$x+y+z=6$$
$$x-y+z=2$$
$$2x+y-z=1$$

(b) What is a square matrix? 2

(c) Define diagonal matrix and column matrix. 2

UNIT—II

4. Answer any *two* of the following questions : 2×2=4

(a) State the distinction between $\lim_{x\to a} f(x)$ and $f(a)$.

(b) Write the necessary and sufficient conditions for a function to be maximum.

(c) If $f(x)$ and $g(x)$ are two functions of x, then find

$$\frac{d}{dx}[f(x)\cdot g(x)]$$

5. (a) Discuss the continuity of the following function :

$$f(x) = -x, \quad x \le 0$$
$$= x, \quad 0 < x < 1$$
$$= 2-x, \quad x \ge 1$$

at 0 and 1. 4

(b) Show that the function $x+\frac{1}{x}$ has a maximum and minimum, but the maximum is less than the minimum. 4

(c) Evaluate : 2

$$\lim_{x\to 2}\frac{x^2-5x+6}{x^2+x-6}$$

OR

6. (a) Evaluate : 2×2=4

(i) $\lim_{x\to\infty}\frac{3x^2-x+2}{x^2+8x-1}$

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

(b) If $y=\frac{x^2-1}{x^2+1}$, then find $\frac{dy}{dx}$. 3

(c) Find $\frac{dy}{dx}$, if $3x^4 - x^2y + 2y^3 = 0$. 3

UNIT—III

7. Answer any *two* of the following questions : 2×2=4

(a) Write down the relation among mean, median and mode.

(b) What is measure of variation?

(c) Give any two examples of open-end classes.

8. Calculate mean, median, mode and standard deviation from the following data : 10

Marks	0–10	10–20	20–30	30–40	40–50
No. of Students	3	5	10	17	20

Marks	50–60	60–70	70–80	80–90	90–100
No. of Students	30	7	5	2	1

OR

9. From the data given in Q. No. **8**, find the quartile deviation. 10

UNIT—IV

10. Answer any *two* of the following questions : 2×2=4

(a) Interpret, $r = 0$ and $r = +1$.

(b) Write down the regression equation of X on Y and Y on X.

(c) Distinguish between correlation and regression (any *two* differences).

11. Calculate the correlation coefficient between the marks of Maths and marks of Statistics :

Marks of Maths (X)	:	25	35	40	55	45	85	95	90	80	75
Marks of Stat (Y)	:	35	45	30	45	55	75	85	70	90	85

Also find r^2. 8+2=10

OR

12. *(a)* Write a note on Spearman rank correlation. 5

(b) From the data given in Q. No. **11**, calculate the regression coefficient of Y on X. 5

UNIT—V

13. Answer any *two* of the following questions : 2×2=4

(a) Name two tests for ideal index number.

(b) Give two examples of seasonal variation.

(c) Give two examples of irregular variation.

14. *(a)* Fit a linear trend by the method of least squares : 6

Year	: 2000	2001	2002	2003	2004	2005
Production (in ₹ crore)	: 7	10	12	14	17	24

(b) Write two drawbacks of the method of moving averages. 4

OR

15. *(a)* Write down the different steps for the construction of index number. 6

(b) Calculate Fisher's ideal index number from the data given below : 4

Commodities	*Base Year*		*Current Year*	
	Price (in ₹)	*Quantity* (in kg)	*Price* (in ₹)	*Quantity* (in kg)
A	10	15	20	14
B	20	20	30	18
C	30	25	25	25
D	40	15	50	12

★★★