First Semester MA Degree Examination- Model Question paper

Behavioural Economics and Data Science

BEDS-CC- 213-QUANTITATIVE TOOLS FOR BEHAVIOUR ECONOMICS

Time: 3hrs   **Max. Marks: 75**

Part I

I. Answer all questions from this part. Each question carries one mark.

1. Singular matrix
2. Total derivative
3. Indefinite integral
4. Inflexion point
5. Symmetric matrix
6. Vector
7. Rational function
8. Geometric mean
9. Mean deviation
10. Random experiment

(10*1=10 marks)

Part II

Answer any seven questions in less than 400 words. Each question carries 5 marks

11. If D= 250-50P and S= 25P +25 are demand and supply functions, find equilibrium price. Also find the consumer surplus and producer surplus.

12. Explain the properties of determinants

13. Apply Crammers Rule to find the solution to the following equations.

    $3x+y+z=8$
    $x+y+z=6$
    $2x+y-z=1$

14. Distinguish between differentiation and integration. Explain their application in economics with suitable examples

15. What are the characteristics of an ideal average?

16. Define standard deviation. From the data given below state which series is more consistent?

Variable: 10-20 20-30 30-40 40-50 50-60 60-70

Series A : 20   18   32   40   22   18

Series B : 13   22   40   32   18   10

17. Find rank of the matrix

$$\begin{pmatrix} 1 & 2 & 3 \\ 3 & 6 & 9 \\ 2 & 4 & 6 \end{pmatrix}$$

18. Define kurtosis. From the following frequency distribution determine the Kurtosis and comment on the relative nature of the series:

Size : 3 5 7 9 11 13 15 17 19 21 23

f   : 2 1 2 6 16 25 16 7 3 1 1

19. Memory capacity of 9 students was tested before and after a course of medication for a month. State whether the course was effective or not from the data below (in same units).

Before	10	15	9	3	7	12	16	17	4
After	12	17	8	5	6	11	18	20	3

20. Solve $(x+y)2 + (x+y)-6=0$ and $(x-y) = 1$

(7*5=35 marks)

Part III

Answer any 3 questions in less than 1200 words. Each question carries 10 marks

21. Use Lagrangian multiplier to optimise the following function subject to the given constraint. Also estimate the effect on the value of the objective function from 1 unit change in the constant of the constraint.

$Z=4x^2-2xy+6y^2$, subject to $x+y=72$

22. Find inverse of A. Verify that $A \times A^{-1} = I$

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

23. The weekly wages of 1000 workmen are normally distributed around a mean of Rs70 and with a standard deviation of Rs 5. Estimate the number of workers whose weekly wages will be

(i) between Rs 70 and Rs 72   (ii) between Rs 69 and Rs 72

(iii) more than Rs 75   (iv) less than Rs 63

Also estimate the lowest wages of the 100 highest paid workers.

24. Calculate the co-efficient of skewness based on mean and median from the following distribution:

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students	6	12	22	48	56	32	18	6

25. Explain the various probability distributions.

(3*10=30 marks)