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M – 5843

Reg. No. :

Name :

First Semester M.A. Degree Examination, November 2021

Behavioural Economics and Data Science

BEDS- 513 : QUANTITATIVE TOOLS FOR BEHAVIOURAL ECONOMICS

(2020 Admission)

Time : 3 Hours

Max. Marks : 75

PART – I

Answer **all** questions from this part. **Each** question carries **1** mark.

1. Kurtosis
2. Probability Density Function
3. Conditional Probability
4. Baye's Theorem of Probability.
5. Find $\lim_{x \rightarrow 2} \frac{x^5 - 32}{x^4 - 16}$
6. Define Universal set and Power set.
7. Constrained Optimization
8. Square Matrix.
9. Rules of Algebra
10. Rank of a matrix.

(10 × 1 = 10 Marks)

PART – II

P.T.O.



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

11. Find the maxima and minima values of $Z = f(x, y) = 8x^3 + 2xy - 3x^2 + y^2 + 1$.

12. Find the value of the determinant $|A| = \begin{vmatrix} 1 & 18 & 72 \\ 2 & 40 & 96 \\ 2 & 45 & 75 \end{vmatrix}$.

13. Given the supply function $P = (Q + 3)^2$, find the producer's surplus PS at $P_0 = 81$ and $Q_0 = 6$.

14. Briefly explain Central limit theorem.

15. What is meant by Skewness? How is it measured? Given Mean = 34.5, Mode = 35.0, Variance = 25. Find a measure of Skewness.

16. Probability that a batsman scores a century in a cricket match is $\frac{1}{3}$. Find the probability that out of 5 matches, he may score century in (i) exactly 2 matches (ii) no match.

17. A bag contains 4 white and 6 black balls. Two balls are drawn one after another with replacement. (i) What is the probability that both are white (ii) find the probability if the first ball is not replaced before the second drawn.

18. If the demand law is $p = a - bx$. Find the Total revenue and Marginal revenue functions.

19. Briefly explain the important functions used in economics and give one example for each.

20. Explain the importance of Matrix algebra in Economics and briefly explain different types of Matrices.

(7 × 5 = 35 Marks)

PART – III

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



21. Given a system of Linear equation

$$-2X + Y + 3Z = 2$$

$$4X + 2Y - Z = 3$$

$$5X - 4Z = 4$$

Solve the equation using matrix approach.

22. Given the function $y = f(x_1, x_2, x_3) = 10 + 2x_1^2x_2 + 3x_2^2x_3^2$. Find all nine second order partial derivatives.

23. For a Normal distribution, Mean = 45, Standard deviation = 12. Find Median, Mode, Quartile Deviation, Mean Deviation and measure of Kurtosis.

24. Optimise $Z = 4x^2 - 3x + 5xy - 8y + 2y^2$ subject to $x = 2y$ using Lagrange multiplier method.

25. Write a short note on Binomial, Poisson and Normal distribution and its properties.

(3 × 10 = 30 Marks)

