

(Pages : 3)

P – 5537

Reg. No. :

Name :

First Semester M.A. Degree Examination, September 2022

Behavioural Economics and Data Science

BEDS 513 : QUANTITATIVE TOOLS FOR BEHAVIOURAL ECONOMICS

(2020 Admission Onwards)

Time : 3 Hours

Max. Marks : 75

PART – I

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

1. Transpose of a Matrix
2. Quadratic function
3. Skewness
4. Linear function and Non-linear function.
5. Chi-Square distribution
6. Explicit and implicit functions
7. Binomial distribution
8. Equally likely events
9. Standard deviation
10. Use the Quadratic formula to solve the quadratic equation. $2q^2 - 85q + 200 = 0$.

(10 × 1 = 10 Marks)

P.T.O.



PART – II

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

11. Briefly explain basic matrix operations.
12. Solve the following equations by Crammer's Rule.

$$3x + 2y + z = 6, 2x - 3y + 3z = 2 \text{ and } x + y + z = 3.$$

13. If $A = \{1, 2, 3, 4, 5, 6, 7\}$, $B = \{2, 4, 6, 8\}$ find

- (a) $A \cup B$
- (b) $A \cap B$
- (c) $A - B$
- (d) $B - A$

14. Find the inverse of the matrix $A = \begin{bmatrix} 1 & 3 & 0 \\ -2 & 3 & 3 \\ 1 & 1 & 4 \end{bmatrix}$.

15. A bag contains 5 red and 3 black balls and a second bag contains 4 red and 5 black balls. One of the bags is selected at random and a draw of two balls made from it. What is the probability that one of them is red and the other black?

16. Write a short note on F distribution.

17. In a distribution, the difference between two quartiles is 15; their sum is 35. Q_2 is 20. Find the coefficient of Skewness.

18. If $y = x^2 e^x$, find $\frac{d^2 y}{dx^2}$.

19. Find the maximum and minimum values of $y = x^3 - 3x^2 + 5$.

20. $P(A \cup B) = 0.6$, $P(A) = 0.4$, $P(B) = 0.3$. Find $P(A \cap B)$, $P(A/B)$, $P(B/A)$.

(7 × 5 = 35 Marks)



PART – III

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

21. Write a short note on Rank of a Matrix and find the rank of the following matrix

(a) $\begin{bmatrix} 1 & 2 & -1 \\ 2 & 4 & 3 \\ -1 & -2 & 6 \end{bmatrix}$

(b) $\begin{bmatrix} 3 & 2 & 4 \\ 1 & 3 & 1 \\ 5 & 1 & 7 \end{bmatrix}$.

22. Solve the following system of equations by matrix inversion.

$$2x + y + 3z = 15$$

$$x - 2y + 5z = 13$$

$$4x + 3y - z = 11$$

23. Write a short note on Economic applications using differential calculus and Integral calculus.

24. Fit a Normal distribution.

Class : 60-62 63-65 66-68 69-71 72-74

F : 5 18 42 27 8

25. Optimise the function $f(x,y) = xy$ subject to the constraint $x^2 + y^2 = 8$ using Lagrange multiplier method.

(3 × 10 = 30 Marks)

