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**S – 6202**

**Reg. No. :** .....

**Name :** .....

**First Semester M.A. Degree Examination, April 2024**

**Economics**

**EC 214 : QUANTITATIVE METHODS FOR ECONOMICS**

**(2018 Admission Onwards)**

Time : 3 Hours

Max. Marks : 75

**SECTION – A**

Answer **all** questions in **one** or **two** sentences. Each carries **1** mark.

1. What is Type I error?
2. What is an objective function in LPP?
3. What is input output analysis?
4. What is meant by Cobweb Model?
5. Define the marginal utility.
6. Define input output transaction matrix.
7. What is meant by optimal solution in LPP?
8. What is normal distribution?
9. Define confidence interval.
10. What is level of significance?

**(10 × 1 = 10 Marks)**

P.T.O.



## SECTION – B

Answer any **seven** questions. Each carries **5** marks.

11. Solve the following simultaneous equation using matrix inversion method

$$2x_1 + 3x_2 = 13$$

$$x_1 - 6x_2 = -1$$

12. Find the eigen values of the given matrix

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

13. Solve the differential equation  $dy/dx = y/x$ . Hence find the particular solution given in the initial condition that  $y = 10$  when  $x = 10$

14. What is normal distribution? State the important properties of normal distribution.

15. Maximize the utility function  $U(x, y) = 5xy$  subject to  $x + 2y = 8$

16. Find the dual of the following LPP

$$\text{Maximize } 3x + 2y + 4z$$

$$\text{Subject to } 3x + 7y + z \leq 12$$

$$x - 2y + 3z \leq 15$$

$$x + y + z \leq 5$$

$$x, y, z \geq 0$$

17. A coin is tossed 6 times. What is the probability of obtaining 4 or more heads.

18. If 3% electric bulbs manufactured by a company are defective. Use Poisson distribution to find the probability that in a sample of 100 bulbs exactly five are defective?

19. A particular brand of electric bulb has a mean lifetime of 1400 hours with SD of 64 hours. A random sample of 100 bulbs when tested showed a mean lifetime 1250 hours. Test whether the life time of the bulb has gone down or not?

20. Write a note on the procedure to test 9 statistical hypothesis.

**(7 × 5 = 35 Marks)**



SECTION – C

Answer any **three** questions. Each carry **10** marks.

21. Solve the following simultaneous equations using Cramer's Rule

$$2x_1 + 1x_2 + 3x_3 = 15$$

$$x_1 - 2x_2 + 5x_3 = 13$$

$$4x_1 + 3x_2 - x_3 = 11$$

22. The mean weight of 500 male students in a college is 151 *lbs* and the SD is 15 *lbs*. Assuming that the weights are normally distributed, find how many weight

(a) Between 120 *lbs* and 155 *lbs*

(b) More than 185 *lbs*

23. Find the inverse of the matrix A using Cayley Hamilton Theorem

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

24. What is input output analysis in Economics? Discuss its major assumptions and applications.

25. What is meant by sampling? Discuss the important probability and non-probability sampling methods.

**(3 × 10 = 30 Marks)**

