Reg. No…….. Name…… **25P165**

M. Sc. DEGREE END SEMESTER EXAMINATION - NOVEMBER 2025

SEMESTER 1: COMPUTER SCIENCE (ARTIFICIAL INTELLIGENCE)

COURSE: **24P1CAIT05: FOUNDATIONS OF DATA ANALYTICS**

(*For Regular 2025 Admission & Improvement/Supplementary 2024 Admission)*

Time: Three Hours Max. Weightage: 30

PART A

Answer any 8 questions. **Weight: 1**

1. What are the properties of arithmetic mean? (U, CO 1)
2. Explain the uses of a scatter diagram. (U, CO 1)
3. Distinguish between discrete and continuous sample spaces with examples. (U, CO 2)
4. Define the joint density function of a pair of random variables. Write its properties. (R, CO 2)
5. Define the terms (I) statistic (ii) parameter (iii) standard error (R, CO 3)
6. Define sufficiency in point estimation. (R, CO 3)
7. Define null hypothesis and alternative hypothesis. (R, CO 4)
8. Give the test statistic for testing the equality of means of two normal populations. (R, CO 4)
9. Explain a Gaussian prior. (U, CO 5)
10. Explain logistic regression. (U, CO 5)

(1 x 8 = 8)

PART B

Answer any 6 questions. **Weights : 2**

11. The mean wage of 100 laborers working in a factory running two shifts of 60 and 40 workers respectively is Rs. 38. The mean wage of 60 laborers in the morning shift is Rs. 40. Find the mean wage of the laborers in the evening shift. (A, CO 1)
12. Write the formula of Spearmann's rank correlation coefficient. And what is its advantage over Karl Pearsons coefficient of correlation? (U, CO 1)
13. (a) State Baye's theorem. (b)There are two identical boxes containing respectively 4 white and 3 red balls; 3 white and 2 red balls. A box is chosen at random and a ball is drawn from it. If the ball is white find the probability that it is from the first box? (A, CO 2)

14. If 20% of the articles manufactured by a company are defective determine the probability that out of 4 articles chosen at random utmost 2 are defective. (A, CO 2)

15. Distinguish between statistic and parameter with examples. (U, CO 3)

16. Write the properties of maximum likelihood estimators. (U, CO 3)

17. What are the steps in a statistical test procedure? (U, CO 4)

18. Write short note on ridge regression. (U, CO 5)

(2 x 6 = 12)

PART C

Answer any 2 questions. **Weights : 5**

19. The scores obtained by two students A and B are given below. Calculate the coefficient of variations and state which student is more consistent (A, CO 1)

A	58	59	60	65	66	52	75	69	54	52
B	87	89	78	73	84	65	66	56	71	46

20. (a) Write the properties of the normal distribution. (b) The weekly wages of 1000 workmen are normally distributed with a mean 70 and a standard deviation 15. Estimate the number of workers whose weekly wages will lie between 69 and 72. (A, CO 2)

21. (a)Write the properties of a good estimate. (b) The mean of a sample of size 20 from a normal population N(μ,8) was found to be 81.2. Find a 90% confidence interval for μ. (A, CO 3)

22. The following relates to marital status and performance in an examination. (A, CO 4)

Examine whether performance depends on marital status.

	Good	Bad	Total
Married	60	80	140
Unmarried	20	40	60
Total	80	120	200

(5 x 2 = 10)

****