Question Paper Code	12370

M.E - DEGREE EXAMINATIONS, NOV / DEC 2023
First Semester
M.E - Industrial Safety Engineering
20PISMA101 - PROBABILITY AND STATISTICAL METHODS
(Regulation 2020)

Duration: 3 Hours   Max. Marks: 100

PART-A (10 × 2 = 20 Marks)
Answer ALL Questions

Marks, K-Level, CO

1. Find the probability of 53 Monday's in a leap year. — *2,K3,CO1*
2. Prove that P(A')=1-P(A), where A' is the complement of A. — *2,K3,CO1*
3. Explain principle of least squares method. — *2,K3,CO2*
4. Define the term regression. — *2,K3,CO2*
5. What is Type I and Type II error? — *2,K3,CO3*
6. State the condition for Chi Square Test. — *2,K3,CO3*
7. What does the term 'ANOVA' stands for? — *2,K3,CO4*
8. Write down the formula for student's t distribution for two proportions. — *2, K3CO4*
9. Write the normal equation for the curve y = ax+b. — *2,K3,CO5*
10. Explain the term seasonal variation. — *2,K3,CO5*

PART - B (5 × 16 = 80 Marks)
Answer ALL Questions

11. a) The number of typing mistakes that a typist makes on a given page has Poisson distribution with mean of 3 mistakes. What is the probability that she makes i) Exactly 7 mistakes ii) fewer than 4 mistakes, iii) No mistakes on a given page. — *16,K3,CO1*

OR

    b) Find the mean and variance of the binomial distribution. 6 dice are thrown 729 times. How many times would you expect 5 or 6? — *16,K3,CO1*

12. a) What are various steps involved in MLE and explain with an example. — *16,K3,CO2*

OR

    b) Find the correlation coefficient of the following data and obtain regression lines. — *16,K3,CO2*

X	42	44	58	55	89	98	66
Y	56	49	53	58	64	76	58

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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13. a) A buyer of electric bulbs bought 100 bulbs from each one of two *16,K3,CO3* famous brands. Upon testing these he found that brand A had a mean life of 1500 hours with a standard deviation of 50 hours whereas brand B had a mean life of 1530 hours with a standard deviation of 60 hours. Can it be concluded at 5 % level of significance, that two brands differ significantly in quality?

OR

b) A sample of heights of 6400 Englishmen has a mean of 170 cm. and a *16,K3,CO3* standard deviation of 6.4 cm, while a sample of heights of 1600 Americans has a mean of 172 cm. and a standard deviation of 6.3 cm. Do the data indicate that Americans are on the average taller than Englishmen?

14. a) The following table gives the moisture content in paneer prepared by 4 *16,K3,CO4* methods :

M1	50.3	52.2	52.5	51.7	52.6	
M2	54.1	53.7	55.5	54.6		
M3	57.5	56.3	55.8	56.9	55.8	59.6
M4	52.3	53.2	53.6	53.4	53.8	

Analyze the data to find whether the mean moisture content in Paneer prepared by different methods.

OR

b) Briefly explain the concept of two way classification with an example. *16,K3,CO4*

15. a) Explain the various methods of Time series Analysis. *16,K3,CO5*

OR

b) Explain the concept of auto regression process. *16,K3,CO5*