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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Second Semester, M.Tech. - Mechanical Engineering (MMDN)

Semester End Examination; May/June - 2018

Statistical Modeling and Experimental Design

Time: 3 hrs

Max. Marks: 100

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

- 1 a. Explain the measure of central tendency with suitable examples. 10
- b. For the following data prove that frequency distribution is symmetrical by showing that mean, median, mode are same. 10

Class Interval	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	5	10	15	20	15	10	5

2. Explain the concept of,
i) Variables ii) Types of distribution. 20

UNIT - II

3. What is experimental design? Discuss some typical application of experimental design. 20
4. Elaborate the guidelines for designing experiments. 20

UNIT - III

- 5 a. What is factorial Designs? Mention the advantages and application of it. 10
- b. Explain the two factor factorial design. 10
6. Explain in detail two level factorial Design. 20

UNIT - IV

7. Explain regression analysis in detail with suitable examples. 20
8. Develop the two regression equations and coefficients for the following data. 20

Lot Number	A	B	C	D	E	F	G	H	I
Oil Temperature °C (in ten Deg Centigrade)	1	2	3	4	5	6	7	8	9
Hardness (Units)	1	3	2	5	5	7	6	9	9

- i) Estimate the Hardness of the specimen if 10°C oil Temperature is maintained.
- ii) Determine the Oil Temperature °C required (in ten Deg Centigrade) if 12 units of hardness is to be achieved.

UNIT - V

9. Explain S/N ratio for static problems. 20
10. Explain S/N ratio for dynamic problems. 20

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