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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 (MCIM)

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, 20

i) Variables ii) Types of distribution.

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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