

Total No. of Questions : 7]

SEAT No. :

P4060

[Total No. of Pages : 2

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**M.E. (Mechanical) (Heat Power / Design / Mechatronics / CAD/
CAM / Energy Engineering)**

RESEARCH METHODOLOGY

(2013 Course) (Semester - I)

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) Answer any five questions.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*
- 4) Use of pocket calculator and different gas charts as applicable is allowed.*
- 5) Assume suitable data, if necessary.*

- Q1)** a) State and discuss the eight step model for Research Process starting from formulation of research problem till research report writing. **[5]**
- b) Discuss the significance of Research in different fields in terms of benefit to society with suitable examples. **[5]**

- Q2)** a) What do you mean by Citation and Impact Factor of a Journal? Explain the significance of a Peer reviewed Journal Papers for literature review. Discuss the impact of referring open access non-peer reviewed Journals / websites on research process / Validation of results. **[5]**
- b) Explain the term Plagiarism? How the Plagiarism in thesis / publications can be avoided. **[5]**

- Q3)** a) Explain the term variables and different types of variables used in Research. **[5]**
- b) Discuss the common errors encountered in selecting a Research Problem. **[5]**

P.T.O.

- Q4)** a) Discuss the significance of validation of experimental results vis-à-vis mathematical modeling / Literature data. [5]
 b) Write down the outline/structure of Research Proposal. What are the different government agencies which fund research projects. [5]

- Q5)** a) Discuss good measurement practice a researcher should follow during while measurement. [5]
 b) Explain Curve fitting and regression analysis with suitable examples. [5]

- Q6)** a) Define : [5]
 i) Range.
 ii) Accuracy.
 iii) Precision.
 iv) Sensitivity.
 v) Resolution.
 vi) Threshold / Dead zone.
 b) Fit the regression model for the following data for demand in thousand units of automobiles for last 16 years for a manufacturer where A-Year, B-Units sold in thousands. [5]

A	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
B	172.8	116.2	156.8	134.4	144.9	123.9	122.6	126.7	111.5	147.1	139.1	149.8	161.6	151	152.4	172.8

- Q7)** a) How to select a suitable journal for publishing your work under Elsevier / Springer / IEEE / Taylor and Francis. Discuss steps in publishing a research paper in Peer reviewed Journal. [5]
 b) Discuss the structure of a research paper published in a standard Journal under Elsevier. And also discuss formatting standards used in writing a research paper for Elsevier. [5]

