



- Notes :
1. All questions carry equal marks.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Assume suitable data wherever necessary.
  4. Diagrams and Chemical equation should be given wherever necessary.
  5. Illustrate your answers wherever necessary with the help of neat sketches.
  6. Solve **any five** questions.

1. a) Discuss any five objectives of a good research. 7  
b) What do you understand by Empirical Research? How is more relevant to the field of engineering & Technology? 7
2. a) Define Hypothesis. Discuss briefly any five sources of hypothesis. 7  
b) Explain about simple Regression and partial correlation in detail. 7
3. a) Explain in brief the difference between collection of data through questionnaires and schedules. 7  
b) Distinguish between an experiment and survey. Explain fully the survey method of research. 7
4. a) Describe some of the important research designs, used in experimental hypothesis testing research study. 7  
b) "Research design dictate boundaries of the research activity". Explain by citing appropriate example from Mechanical Engineering. 7
5. a) Explain and illustrate the procedure of selecting a random sample. 7  
b) Enlist any seven characteristics of case study. 7
6. a) What are various types of reports? Explain each type briefly. 7  
b) What points will you keep in mind while preparing a research report? Explain. 7
7. a) What is ANOVA? Explain about the basic principle of ANOVA Technique. 7  
b) Explain in detail- 7
  - i) Short-cut method for one way ANOVA
  - ii) ANOVA in Latin-square Design
8. a) Discuss significance of t-test & f-test. 7  
b) What is probability sampling? Explain any one probability sampling. 7

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