



**K. K. Wagh Institute of Engineering Education & Research, Nashik**  
(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:I
Class:PG-I	Program:M.Tech
Branch Code:ETC	Pattern:2024
Name of Course:Research Methodology and IPR	Course Code:2402505
Max. Marks:60	Duration:2.30 Hrs.

**Instructions:** Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 2 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

**Marks CO**

**Question No. 1**

- 1a) Distinguish between Research Techniques and Research Methodology. Explain the essential criteria for a good research study. (6) CO1

**Question No. 2**

- 2a) Describe the Taguchi Method and its steps for planning a set of experiments or simulations in a manufacturing process. (6) CO2

**Question No. 3**

- 3a) Discuss the Strategy of Experimentation and provide four guidelines for designing effective experiments. (8) CO3

**OR**

- 3b) Describe the Basic Statistical Concepts necessary for experimentation. Explain the Regression Approach to Analysis of Variance. (8) CO3

- 3c) Explain the fundamentals of Genetic Algorithms (GA) and Simulated Annealing (SA) as evolutionary algorithms for optimization. (8) CO3

**OR**

- 3d) Explain Sensitivity Theory and its applications in the design of experimental systems. (8) CO3

**Question No. 4**

- 4a) Explain the general Procedure for Hypothesis Testing. Detail the concepts of Test Statistics and Critical Region. (8) CO4

**OR**

- 4b) Describe the hypothesis testing procedure for the Difference of Two Proportions. Give one industrial application of this test. (8) CO4

- 4c) Explain the use of the Chi-square Test for Independence of Attributes. State the necessary cautions in using Chi-square tests. (8) CO4

**OR**

- 4d) Describe the Chi-square Test for the Difference of more than Two Proportions. Provide the conditions under which this test is valid. (8) CO4

**Question No. 5**

- 5a) Define Intellectual Property Rights (IPR) and explain the key provisions of TRIPS (Trade-Related Aspects of Intellectual Property Rights). (8) CO5

**OR**

- 5b) Explain the concept of Plagiarism. Discuss how citation and acknowledgement contribute to reproducibility and accountability in scholarly publishing. (8) CO5

- 5c) Explain the Significance of Report Writing in a research process. Detail the Different Steps in Writing a Report. (8) CO5

**OR**

- 5d) Describe the Layout of the Research Report. Explain the Mechanics of Writing a Research Report and the precautions involved. (8) CO5

**..... End of question paper.....**