P.E.S. COLLEGE OF ENGINEERING

(AN AUTONOMOUS INSTITUTE)

CHH. SAMBHAJINAGAR-431002

Summer Examination – 2026

Course: F.Y.M.Tech. Branch: Electrical Power System Semester: II

Subject Code & Name: MTPESEPS205T, Research Methodology

Max Marks: 60 Date:08/07/2026 Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any one of the following.**		
	A) Explain the meaning of research and summarize the diverse motivations that drive individuals to undertake it. **Marking Scheme** **Point** — **Marks** Definition/meaning of research — 2 Characteristics of research — 2 Motivations for research — 6 Examples — 2	L2	12
	B) Provide a broad overview of the course objectives of research methodology and how they define research practices. **Marking Scheme** **Point** — **Marks** Introduction to research methodology — 3 Objectives explanation — 6 Research practice applications — 3	L2	12
Q. 2	**Solve Any one of the following.**		
	A) Evaluate the role of a literature review in identifying gaps and successfully formulating a research problem. **Marking Scheme** **Point** — **Marks** Definition of literature review — 2 Importance in gap identification — 4 Research problem formulation — 4 Examples — 2	L5	12
	B) Propose a framework for taking a formulated research problem and transitioning it into a testable working hypothesis. **Marking Scheme** **Point** — **Marks** Definition of hypothesis — 2 Framework/process explanation — 6 Variable identification — 2 Testing feasibility/examples — 2	L5	12

Q. 3	**Solve Any one of the following.**		
	A) Map out the different components necessary for developing a robust research plan. **Marking Scheme** **Point** **Marks** Introduction to research plan 2 Components explanation 7 Importance/applications 3	L4	12
	B) Compare the stages of the research life cycle framework and design a methodology around them. **Marking Scheme** **Point** **Marks** Introduction 2 Stages comparison 5 Methodology design 5	L4	12
Q. 4	**Solve Any one of the following.**		
	A) Analyze the significance of simulation in representing technical research problems. **Marking Scheme** **Point** **Marks** Definition of simulation 3 Need/significance 4 Technical applications 5	L4	12
	B) Examine the different classifications of models used in research and how they are analytically validated. **Marking Scheme** **Point** **Marks** Introduction to models 3 Classification of models 5 Analytical validation methods 4	L4	12
Q. 5	**Solve Any one of the following.**		
	A) Describe the procedure for hypothesis testing and outline various statistical analysis techniques. **Marking Scheme** **Point** **Marks** Introduction to hypothesis testing 3 Procedure steps 5 Statistical techniques 4	L3	12
	B) Prepare an outline detailing the essential components of report writing and scholarly research papers. **Marking Scheme** **Point** **Marks** Introduction to report writing 3 Components of report 6 Scholarly paper structure 3	L5	12
	***** End *****		