

P.E.S. COLLEGE OF ENGINEERING (AN AUTONOMOUS INSTITUTE) CHH. SAMBAJINAGAR-431002 Regular Summer Examination – 2026 Course: F.Y.M.Tech. Branch : EPS Semester : II Subject Code & Name: MTPSEPS202T & Advanced Power System Protection Max Marks: 60 Date:01/07/2026 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 construction and working principle of static relays. Discuss level detectors, replica impedance and mixing circuits. Points Marks Construction of static relays 3 Working principle 3 Level detectors 2 Replica impedance 2 Mixing circuits 1 Conclusion 1	L-2 / CO1	12
B)	Explain amplitude comparators used in static relays. Discuss circulating current type and opposed voltage type comparators. Points Marks Introduction to amplitude comparator 2 Circulating current type comparator 4 Opposed voltage type comparator 4 Applications 1 Conclusion 1	L-3 / CO1	12
Q.2	Solve Any one of the following.		
A)	Explain coincidence circuit type phase comparator and integrating type phase comparator with neat diagrams. Points Marks Coincidence circuit phase comparator 5 Integrating type comparator 5 Neat diagrams 1 Conclusion 1	L-3 / CO2	12
B)	Discuss the operation and characteristics of instantaneous, definite time and inverse definite minimum time over-current relays. Points Marks Instantaneous over-current relay 3 Definite time relay 3	L-4 / CO2	12

	IDMT relay 4 Characteristics 1 Conclusion 1		
Q. 3	Solve Any one of the following.		
A)	Explain static differential relay schemes and discuss dual bias transformer differential protection. Points Marks Static differential relay concept 3 Relay schemes 3 Dual bias transformer protection 4 Applications 1 Conclusion 1	L-3 / CO3	12
B)	Explain the operating principles and characteristics of static impedance, reactance and MHO relays. Points Marks Static impedance relay 4 Reactance relay 3 MHO relay 3 Characteristics 3 Conclusion 3	L-4 / CO3	12
Q.4	Solve Any one of the following.		
A)	Explain conic section characteristics and three input amplitude comparator used in multi-input comparator schemes. Points Marks Power swing concept 3 Effect on distance relays 4 Out-of-step tripping 2 Blocking relays 2 Conclusion 1	L-4 / CO4	12
B)	Discuss the effect of power swings on the performance of distance relays. Explain out-of-step tripping and blocking relays Effect of line length and source impedance on relay performance. Points Marks Power swing concept 3 Effect on distance relays 4 Out-of-step tripping 2 Blocking relays 2 Conclusion 1	L-4 / CO4	12
Q. 5	Solve Any one of the following.		
A)	Explain microprocessor-based over-current and impedance relay algorithms using block diagram and flowchart approach. Points Marks Microprocessor relay concept 2 Over-current relay algorithm 4 Impedance relay algorithm 4	L-6 / CO5	12

	Flowchart/block diagram 1 Conclusion 1		
B)	Explain the realization of MHO and offset MHO relay characteristics in digital relaying systems. Points Marks MHO relay characteristics 4 Offset MHO relay characteristics 4 Digital realization 3 Conclusion 1	L-6 / CO5	12
	*** End ***		