P.E.S. COLLEGE OF ENGINEERING

(AN AUTONOMOUS INSTITUTE)

CHH. SAMBHAJINAGAR-431002

Regular Winter Examination – 2025

Course: F.Y.M.Tech. Branch : Adv.Manu.&Mech. Sys Design **Semester : I**
Subject Code & Name:MTPESAMSDPE105AT, Programme Elective – II Failure Analysis & Design Engineering

Max Marks: 60 **Date:** **Duration: 3 Hr.**

MARKING SCHEME

		Marking Scheme	Marks
Q. 1	**Solve Any one of the following.**		
A)	Explain the following theories of failure in details: (i) Maximum strain energy theory in details. (ii) Maximum distortion energy theory	(i) 06 marks (ii) 06 marks	**12**
B)	(i) Describe in details, the applicability of theories of failure. (ii) Explain in detail, the maximum shear stress theory.	(i) 06 marks (ii) 06 marks	**12**
Q.2	**Solve Any one of the following.**		
A)	Explain Griffith theory of brittle fracture in fracture mechanics.	Fracture mechanics-02 marks Griffith theory of brittle fracture-10 marks	**12**
B)	State in details, what is meant by Ductile fracture? Describe the characteristics of ductile fracture.	Ductile fracture-06 marks Characteristics of ductile fracture-06 marks	**12**
Q. 3	**Solve Any one of the following.**		
A)	Describe the J- Integral method of testing in fracture Mechanics and explain General procedure for determining J in this method.	J- Integral method of testing-06 marks General procedure for determining J-06 marks	**12**
B)	Explain the phenomenon of Fatigue crack initiation and propagation.	Fatigue crack initiation -06 marks. Fatigue crack propagation-06 marks.	**12**
Q.4	**Solve Any one of the following.**		
A)	Write a note on "Creep Curve". Explain primary creep and secondary creep.	Note on "Creep Curve-06 marks Primary creep and secondary creep-06 marks	**12**
B)	What are the types of embrittlement of steel? Explain any three of them.	Types of embrittlement of steel-06 marks Explanation of any three of them-06 marks	**12**
Q. 5	**Solve Any one of the following.**		
A)	State and explain the applications of Soderberg's Equation	12 marks	**12**
B)	In case of ductile fracture, explain void formation and growth.	12 marks	**12**