

Code: 22MEMD1T2

I M.Tech - I Semester – Regular Examinations - MARCH - 2023**PRESSURE VESSEL DESIGN
(MACHINE DESIGN)**

Duration: 3 hours

Max. Marks: 60

Note: 1. This paper contains 4 questions from 4 units of Syllabus. Each unit carries 15 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	How is the dilation of a pressure vessel measured? Find the equation for the dilation of a spherical pressure vessel.	L2	CO1	7 M
	b)	Discuss design parameters used in pressure vessels subjected to different loads.	L2	CO1	8 M
OR					
2		Estimate an equation for finding out the hoop stress in a cylindrical pressure vessel, when $d/t < 20$, subjected to internal pressure.	L2	CO1	15 M

UNIT-II					
3		Explain the cylindrical bending of uniformly loaded rectangular plates with simply supported edges.	L2	CO1	15 M
OR					
4		Derive the differential equation for uniformly loaded circular plates with clamped edges.	L2	CO1	15 M
UNIT-III					
5	a)	Discuss different types of fracture in tension.	L2	CO2	7 M
	b)	Discuss the fatigue crack growth and the fatigue life prediction of pressure vessels.	L2	CO3	8 M
OR					
6		Discuss the effect of cold work or strain hardening on the physical properties of pressure vessel steels.	L2	CO2	15 M
UNIT-IV					
7	a)	Explain how surface roughness affects the fatigue life of pressure vessels.	L3	CO3	7 M
	b)	Explain the effect of warm prestressing on the toughness of pressure vessel steels at ambient temperature.	L3	CO4	8 M
OR					

8	Analyze the impact of the environment and other variables on the fatigue life of pressure vessel materials.	L4	CO4	15 M
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