Total No. of Questions – [3]

Total No. of Printed Pages: 2

G.R. No.	

PAPER CODE	V223-265 (RSD)

May 2023 (ENDSEM) EXAM

S.Y. (MECHANICAL) (AY 2022-23 SEMESTER - II)

COURSE NAME: Strength of Materials

COURSE CODE: MEUA22204

(PATTERN 2020)

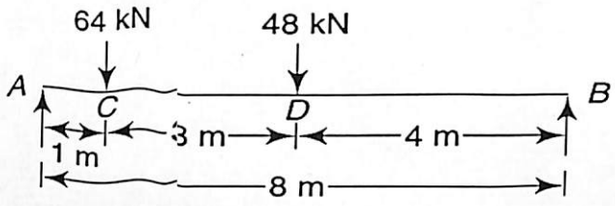
Time: [1Hr]

[Max. Marks: 30]

(*) Instructions to candidates:

1) **Use of scientific calculator is allowed**
2) **Use suitable data where ever required**
3) **All questions are compulsory**

uestion o.	Question Description	Max. Marks	CO mapped	BT Level
.1	a) Discuss with the figure the variation of bending stress for a rectangular cross-section of the beam.	[4]	[4]	[2]
	b) A 200 mm × 400 mm 'I' section beam is to be used as a simply supported beam of 10 m span. The web thickness is 10 mm and the flanges are 20 mm thick. Estimate maximum stress induced due to bending.	[6]	[4]	[3]
	OR			
	c) Estimate maximum shear stress induced and shear stress at a distance of 30 mm above the neutral axis for a rectangular beam of 100 mm wide and 250 mm deep when subjected to a shear force of 50 kN.	[6]	[4]	[3]
2	a) Explain the boundary conditions used to analyze the deflection of the cantilever beam and simply supported beam.	[4]	[5]	[2]
	b) A simply supported beam of length 6 m subjected to a point load of 50 kN at a distance of 4 m from left support. Estimate the deflection at the load point. Use the Macaulay method. Take E = 200 GPa, I = $7.33\times10^{7}mm^{4}$.	[6]	[5]	[3]
	OR			

	c) A simply supported beam of length 8 m subjected to two point loads as shown in **Figure 1**. Estimate the deflection under 64 kN load. Use the Macaulay method. Take E = 210 GPa, I = 180×10^6 mm^4.  **Figure 1**	**[6]**	[5]	[3]
Q.3	a) Discuss the mechanical parts which are subjected to torsion.	**[4]**	[6]	[2]
	b) Derive the following expression $$\frac{T}{J}=\frac{\tau}{r}=\frac{G\theta}{L}$$	**[6]**	[6]	[3]
	OR			
	c) Derive Euler's formula for buckling load for a column with both hinged ends.	**[6]**	[6]	[3]