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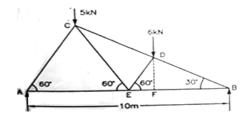
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PARUL UNIVERSITY FACULTY OF ENGINEERING & TECHNOLOGY B.Tech. Winter 2019 - 20 Examination

	B.Tech. Winter 2019 - 20 Examination Semester: 3 Date: 02/12/2019		
	ject Code: 203104207/03104203 ject Name: Introduction to Solid Mechanics/ Structural Analysis - I	Time: 2:00 pm to 4:30 pm Total Marks: 60	
1. A 2. F 3. M	ructions: Il questions are compulsory. igures to the right indicate full marks. Iake suitable assumptions wherever necessary. tart new question on new page.		
Q.1	Objective Type Questions (All are compulsory) (Each of one mark)1. In a cantilever beam, fibers above the neutral axis are in		(15)
	2. (a) Tension (b) Shear (c) Compression (d)None		
	2. On a principal plane, the magnitude of shear stress will be equal to:		
	(a) Maximum (b) Minimum (c) Zero (d) Infinity		
	3. A Redundant frame/truss is also called		
	(a) Perfect (b) imperfect (c) Deficient (d) none of these		
	4. In triangular section, the maximum shear stress occurs at,		
	(a)Apex of triangle (b)Mid height (c)1/3 of the height (d) Base of triangle	•	
	5. At neutral axis bending stress is		
	(a)Minimum (b) Maximum (c) Zero (d) Infinity		
	6. The moment of inertia of a circular section of diameter(d) is		
	7. The formula for bending equation is		
	8. The angle between major principal plane and minor principal plane will be	e always	
	9. Maximum moment for a cantilever beam with uniformly distributed load	`w' over its entire span 'l'	
	10. For a circular section, the ratio of maximum shear stress to the average s	shear stress is	
	11. Define torsion in a shaft.		
	12. What is hoop stress in thin cylinder?		
	13. Eccentricity limit for a rectangular column section is		
	14. The methods which are employed for finding out the forces in a truss are	e	
	15. What do you mean by Structural Vibration?		
Q.2	Answer the following questions. (Attempt any three)		(15)
	A) What do you mean by the terms Principal stress, Principal plane and ang	le of obliquity?	
	B) Explain theory of pure bending of beams and write assumptions in theory	y of pure bending.	
	C) What is the difference between free vibrations and forced vibrations?		
	D) Explain the term truss and the types of truss with neat diagrams.		
Q.3	A) A rectangular beam of 8 m span is simply supported at its ends. The cross 200 mm wide and 400 mm deep. It is loaded by central point load of 200 10kN/m on entire span. Fin the maximum bending stress developed at m diagram.	kN and a UDL of	(07)
	B) A rectangular section is 360 mm wide and 200 mm thick. It carries an eacting on the axis bisecting the width. If the maximum stress induced is minimum stress and eccentricity of load.		(08)

	0	
	B) A beam of length 6 m is simply supported at its ends and carries two point loads of 48kN and 40kN at a distance of 1 m and 3 m respectively from the left support. Find deflection under each	(08)
	load.	
Q.4	A) The ultimate stress, for a hollow steel column which carries an axial load of 1.9 MN is 480	(07)
	N/mm ² . If the external diameter of the column is 200 mm, determine the internal diameter. Take	
	the factor of safety as 4.	
	OR	
	A) Derive of equation of shear stress produced in a circular shaft subjected to torsion.	(07)
	B) A truss of span 10 m is loaded at joint C with 5kN and at joint D with 6 kN as shown in figure.	(08)

Find the reactions and forces in the members of the truss.



OR