SECTION – D

8. Derive an expression of uniformly distributed load on simply supported beam. 20

9. Derive and explain moment area method for fixed beam. 20

Roll No. .....

24171

B. Tech. 4th Semester (ME) Examination – May, 2017

STRENGTH OF MATERIALS - I

Paper : ME-206-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : There are 9 questions in total and students have to attempt 5 questions in total. Q. No. 1 is ***compulsory***. Atleast ***one*** question must be attempted from each Section.

1. Mention the terms : 20

(a) Poison ratio.

(b) Mohr's circle.

(c) Point of contraflexure.

(d) Gordon's formulae.

(e) Method of integration.

(f) Hook's law.

(g) Slenderness ratio.

(h) Shear stress.

(i) Elastic constants.

(j) Two-dimensional stress system.

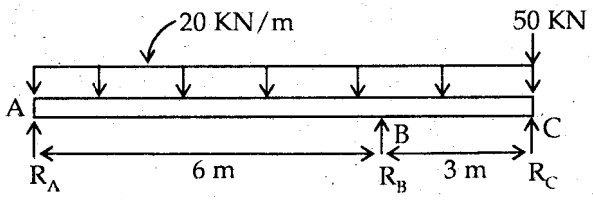
SECTION – A

2. Derive the relationship between elastic constants. 20

3. A cast iron block of 5 cm^2 cross-section carries an axial compressive load of 50 KN, calculate the magnitude of normal and shear stresses on a plane, whose normal is inclined at 30° to the axis of block. Also determine the maximum shear stress in the block. 20

SECTION – B

4. Draw the S.F. & B.M. diagram for the overhanging beam carrying load as shown in Fig. Mark the values of principal ordinates and locate the point of contraflexure if any. 20



5. (a) Describe the advantages of hollow shafts over solid shafts. 10

(b) Prove that a hollow shaft of same weight and material as that of a solid shaft can resist more torque. 10

SECTION – C

6. Explain applications of bending stresses to beams of circular, rectangular, IT and channel sections. 20

7. A tubular steel strut is 8 cm external diameter and 5 cm internal dia., 3 m long and has hinged ends. This is subjected to eccentric load. Find the maximum eccentricity for a crippling load of 60% of Euler load. The yield stress being 300 MPa and E=200 GPa. 20