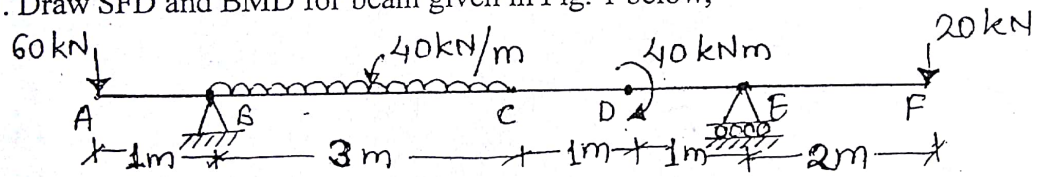
Government College of Engineering, Amravati

Applied Mechanics Department

Class Test 2 | Course Code CEU 303 | Strength of Material

Date: 21/09/2017 | Total Marks : 15 | Time : 1 hr

Q.1. Draw SFD and BMD for beam given in Fig. 1 below, **(06)**



Q.2. Derive and write briefly relations between intensity of loading, shear force and bending moment. **(03)**

Q.3. A Cast Iron beam of I - section is simply supported on a span of 6m. The section consists of a top flange 60mm wide and 20mm thick, web 180mm deep and 20mm thick and bottom flange 160mm wide and 40mm thick. Find the uniformly distributed load on the beam if the tensile stress shall not exceed 30 N/mm^2. If the compressive stress shall not exceed 62.5 N/mm^2. Find the Safe Load. **(06)**

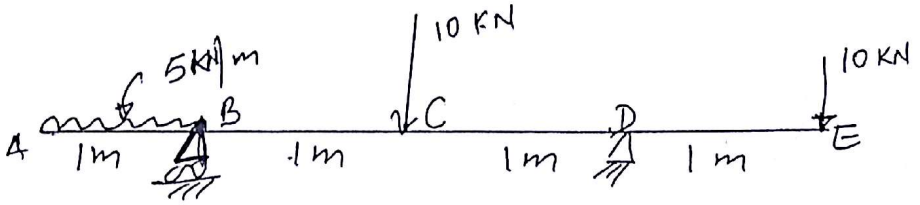
Government College Of Engineering, Amravati
Applied Mechanics Department

Class Test-II | Course Code: - CEU 303 STRENGTH OF MATERIAL(CE/ME)
Date-22/09/15 | Total Marks-15 | Time-1 hr

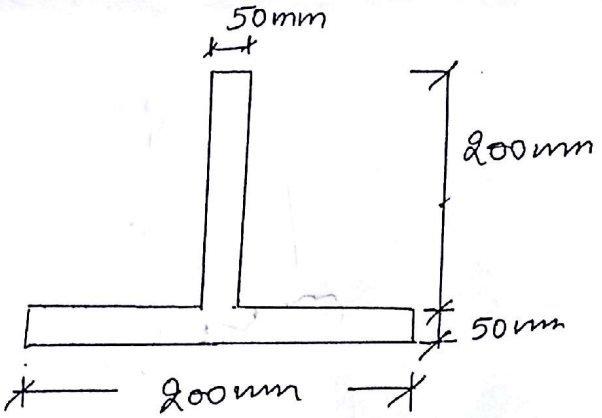
Q.1 i) Write minimum five assumptions made in theory of pure bending. **(03)**

OR

ii) Draw SFD for following beam. **(03)**



Q.2 A simply supported beam of span 6m has cross section as inverted T as shown in fig. Shear force at the section is 50KN. Find maximum shear stress. Also find shear stresses at the joint of web and flange. Draw shear stress distribution diagram. **(06)**



Q.3 A shaft has to transmit power of 250KW running ar 180 rpm, the permissible shear stress is 60Mpa. **(06)**

i) Design a shaft as solid circular section.
ii) Design a shaft as hollow circular section by taking diameter ratio 0.5
iii) Calculate % saving in the material

$$\frac{T}{R} = \frac{I}{I_p} = \frac{C\theta}{l}$$

Government College of Engineering, Amravati

(An Autonomous Institute of Government of Maharashtra)

Class Test II

Winter 2013

Program: B. Tech. Civil / Mechanical

Course: - CEU303 Strength of Materials Max. Marks: - 15 Max. Time: - 1 Hr.

General Instructions: -

1) All Questions are COMPULSORY.
2) Figures to the right indicate full marks.
3) Due credit will be given to the neatness and cleanliness.

1. An overhanging timber beam ABC (AB = 1m, BC = 3 m) has supports B and C as simple supports. An u.d.l. of 12 kN/m acts over entire length of the beam. If the beam is to have a depth to width ratio of 1.5, determine its smallest width. The allowable bending stress (σ) is 9 MPa and the allowable shear stress (τ) is 0.6 MPa. Neglect the self-weight of the beam. **5**

OR

   a) State the assumptions in the theory of pure bending. **2**

   b) Draw the bending stress and shear stress distribution for the cross-sectional shapes of the beams as **(i)** Equal Angle Section, **(ii)** Inverted T-Section, and **(iii)** H-Section. **3**

2. Derive from first principle, the relationship between shear force, bending moment and intensity of loading for any simply supported beam and hence prove that anywhere in the span of the beam, at the point of zero shear force, the maximum bending moment occurs. **5**

3. A wagon of mass 4000 kg is attached to a wire-rope and is moving down an incline at a speed of 3.60 km/hr when the rope jams and the wagon is suddenly brought to rest. If the length of the rope is 50 m at the time of sudden stoppage, calculate the maximum instantaneous stress and the maximum instantaneous elongation produced. Diameter of rope = 36 mm. Take Young's modulus of elasticity E = 2 x 10^5 N/mm^2; acceleration due to gravity g = 9.8 m/s^2. **5**