



RM-6073
B. Arch. I (Sem. II) Examination
May / June – 2010
Structural Design & System - II
(New Course)

Time : 2 Hours]

[Total Marks : 50

Instructions :

(1)

<p>નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી. Fillup strictly the details of signs on your answer book.</p> <p>Name of the Examination :</p> <p>B. Arch. 1 (Sem. 2)</p> <p>Name of the Subject :</p> <p>Structural Design & System - 2 (New)</p> <p>Subject Code No. : 6 0 7 3 Section No. (1, 2,.....) : Nil</p>	<p>Seat No. :</p> <table border="1" style="width: 100%; height: 20px;"><tr><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td></tr></table> <div style="border: 1px solid black; border-radius: 15px; width: 100%; height: 60px; margin-top: 10px; display: flex; align-items: center; justify-content: center;">Student's Signature</div>						

- (2) Assume suitable data and specifically mention it.
- (3) Figures to the **right** indicate full marks.
- (4) Use of Nonprogrammable scientific calculator is permitted.

1 Explain following terms : 3

- (i) Lateral strain
- (ii) Permissible stress
- (iii) Stiffness.

OR

1 Calculate thermal stress if a steel rod of 0.6m length and 3
40 mm diameter with one end fixed and other free, is subjected to increase of 20 degree C temperature. Coefficient of thermal expansion is 0.6×10^{-8} per degree Celsius. Explain your answer.

2 Calculate stresses induced in Cast iron and steel if both 7
the materials are subjected to load as shown in **fig. 1**. Modulus of Elasticity of Cast Iron is 1×10^5 N/mm² and that of Steel is 2×10^5 N/mm².

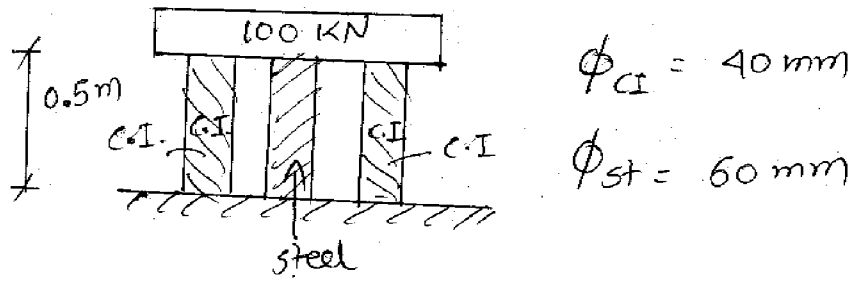


FIG-1

OR

- 2 Calculate stress in various parts of the rod shown in fig. 2. 7
 Also calculate overall deformation of the rod. Modulus of elasticity is $2 \times 10^5 \text{ N/mm}^2$, $\theta_{ab} = 30 \text{ mm}$, $\theta_{bc} = 40 \text{ mm}$, $\theta_{cd} = 60 \text{ mm}$.

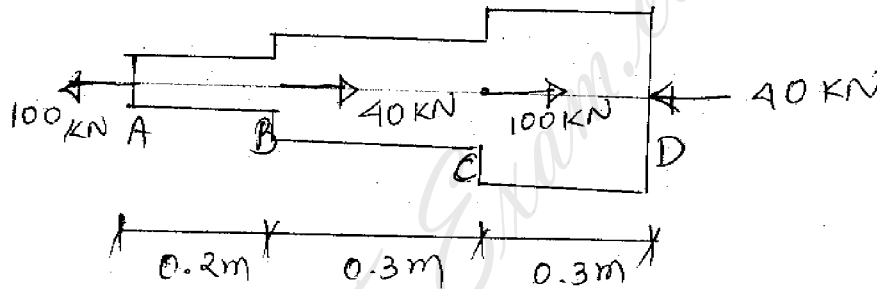


FIG-2

- 3 Locate the Centroid, for the shaded area shown in fig. 3. 12

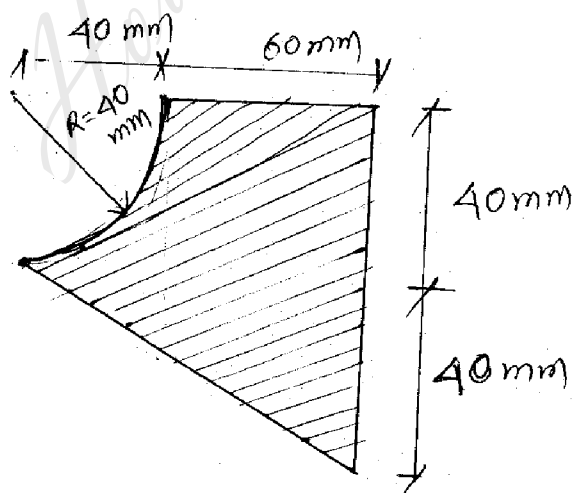


FIG-3

- 4 Calculate MI about the given x-x axis, for the shaded area shown in **fig. 4**. 12

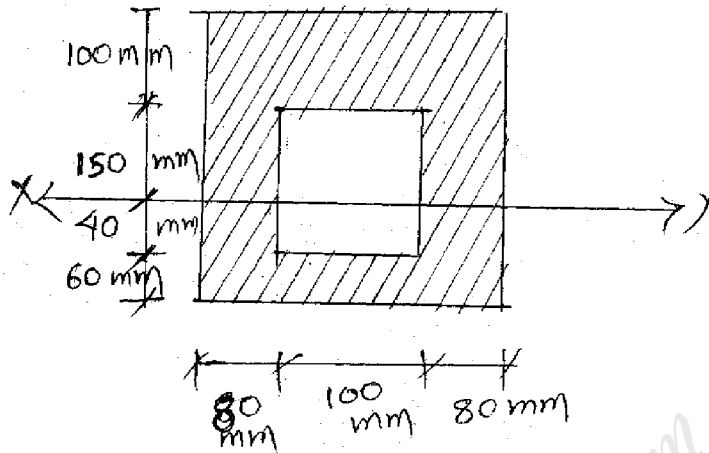


FIG-4

- 5 (a) Calculate and draw shear force and bending moment diagram for the beam shown in **fig. 5**. 7

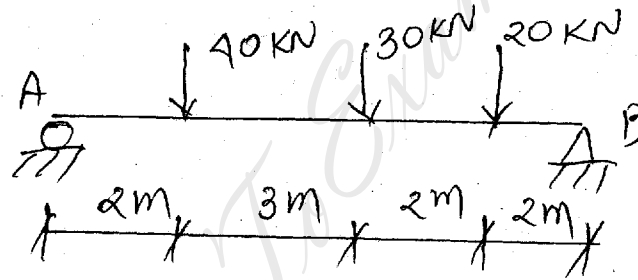


Fig - 5

- (b) Calculate and draw shear force and bending moment diagram for the beam shown in **fig. 6**. 6

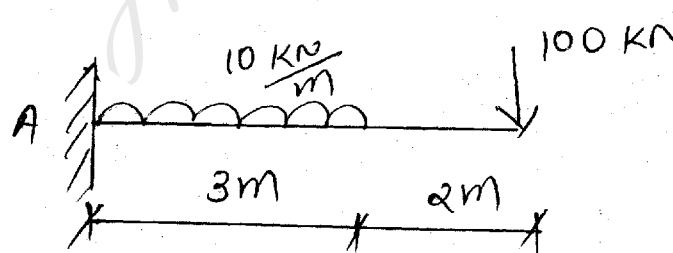


FIG-6

OR

- 5 Calculate and draw shear force and bending moment diagram for the beam shown in **fig. 7** and locate the point of contraflexure. 13

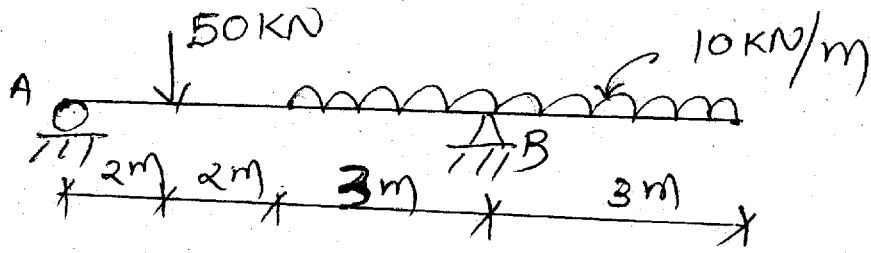


Fig-7

6 Explain and draw bending moment diagram for a Frame shown in fig. 8 or fig. 9.

3

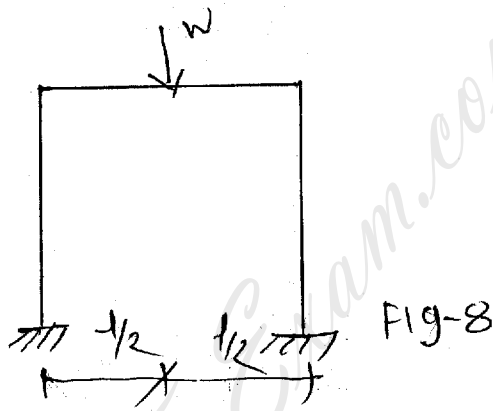


Fig-8

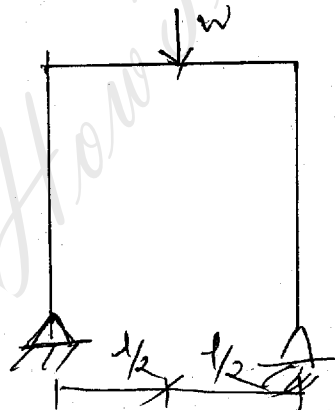


Fig-9