



RN-6105

B. Arch. - II (Sem. III) Examination
May / June - 2010
Structure - III

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दर्शाविएल निशानीवाणी विगतो उत्तरवडी पर अवश्य बपवी.
Fillup strictly the details of signs on your answer book.

Name of the Examination :

Name of the Subject :

Subject Code No. : Section No. (1, 2,.....):

Seat No. :

Student's Signature

- (2) Assume suitable data and specifically mention them.
- (3) Figures to the right indicate full marks.
- (4) Use of non-programmable scientific calculator is permitted.
- (5) Draw detailed drawings to support your answer.

1 (a) Figure 1 shows a Flitched beam consisting of two 14 timber joists and a steel plate securely bolted between them. Beam is simply supported of a span of 5 m carrying 20 kN/m udl. Calculate Maximum Tensile and Compressive stresses on both the materials.
 $E_{\text{steel}} = 2 \times 10^5 \text{ N/mm}^2$, $E_{\text{wood}} = 0.6 \times 10^4 \text{ N/mm}^2$.

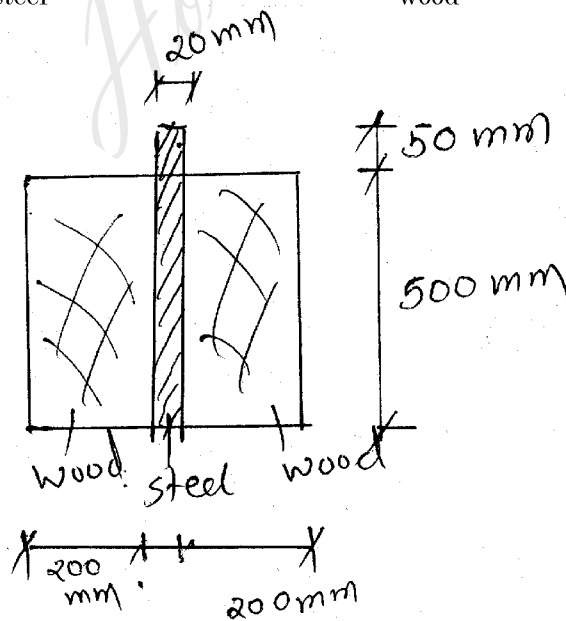


Fig. 1

- (b) For the beam shown in figure 2, calculate bending stresses; also draw the bending stress diagram. 12
Cross section of beam is rectangular of size 230 mm × 550 mm.

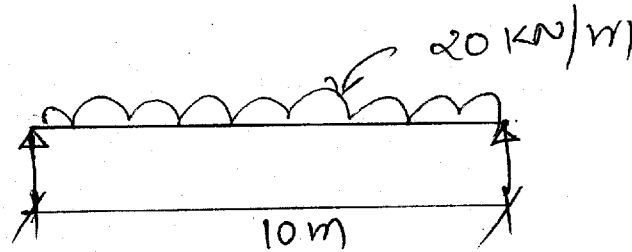


Fig. 2

Attempt any two questions out of Q-2, Q-3 & Q-4.

- 2 Calculate deflection under the point load. Refer figure 3. 12

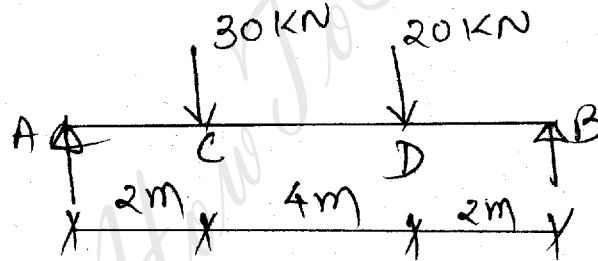


Fig. 3

- 3 Calculate slope and deflection at point A. Refer figure 4. 12

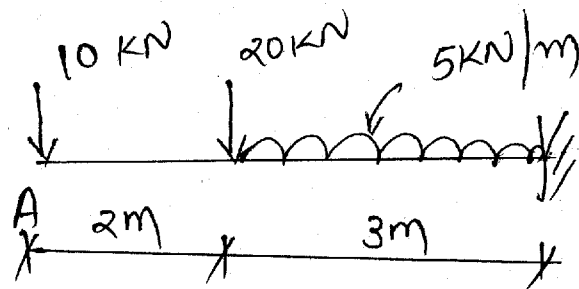


Fig. 4

4 Explain behaviour of Load bearing wall under the effect of seismic load. Explain basic design criteria to consider while designing a building with load bearing wall in a seismic zone. 12

5 Draw bending Moment diagram for the continuous beam shown in figure 5 using Moment Distribution method. 14

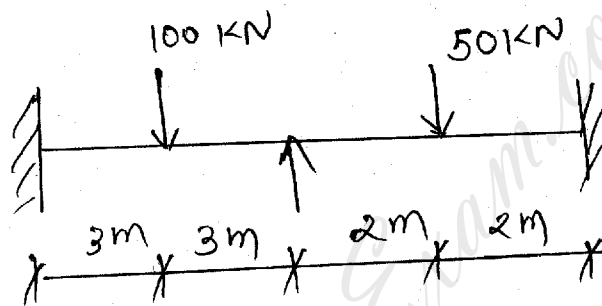


Fig. 5

Attempt any two questions out of Q-6, Q-7 and Q-8.

6 Calculate and draw Shear stress diagram for the beam shown in figure 6, beam is simply supported with a span of 10 m with 20 kN/m loading. 12

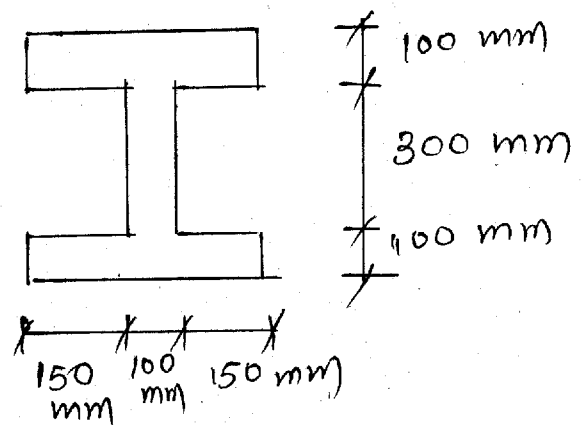


Fig. 6

- 7 A column is subjected to eccentric load of 1000 kN as shown in figure 7. Calculate stresses at points A, B, C and D. 12

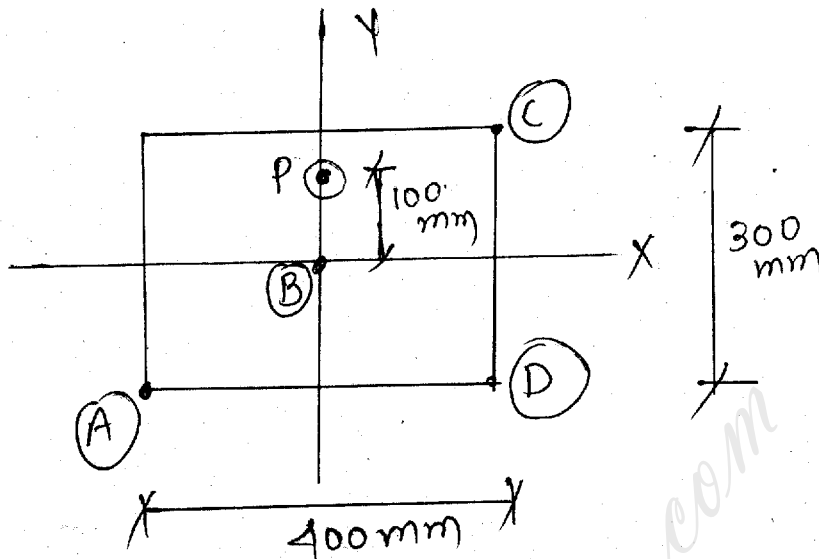


Fig. 7

- 8 Calculate load carrying capacity of a column using Rankine's formula for rectangular column of 300 mm × 550 mm size and 3.5 m length. Both the ends of column are Fixed $\alpha = 1/1600$, $f_c = 550 \text{ N/mm}^2$, $E = 1 \times 10^5 \text{ N/mm}^2$. 12
- 9 Answer the following questions : 12
- (i) Explain failure pattern of column
 - (ii) Why bending stress is maximum at extreme fibers?
 - (iii) What is equivalent area?
 - (iv) What is distribution factor in a moment distribution method?