D 70288　　　　　　　(Pages : 4)

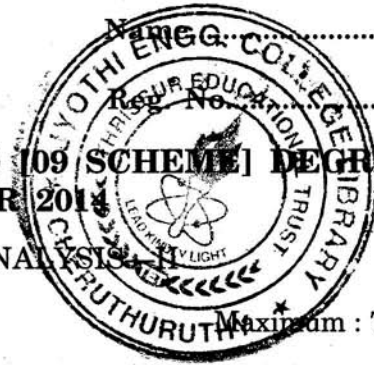Name.....................

Reg. No.................

FIFTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE EXAMINATION, NOVEMBER 2014

CE/PTCE 09 505—STRUCTURAL ANALYSIS II

Time : Three Hours　　　　　　　　　　　　　　　　　　　Maximum : 70 Marks

### Part A

All questions *are* compulsory.

1. Define static indeterminacy with *two* examples.

2. Define sway in frames. Sketch sway and non-sway frames.

3. Write down three-moment equation and explain the terms clearly.

4. Compare portal method and cantilever method.

5. List the assumptions in plastic analysis.

　　　　　　　　　　　　　　　　　　　　　　　　　　$(5 \times 2 = 10 \text{ marks})$
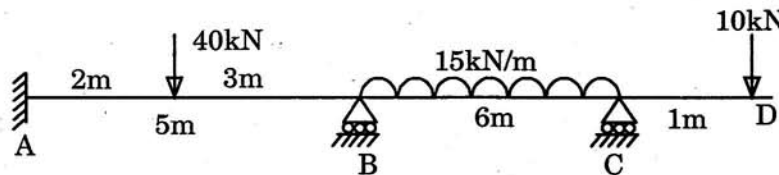
Part B

Answer any **four** *questions.*

1. Analyse the beam shown in Fig. 1 by slope deflection method and draw B.M.D. Assume EI constant.
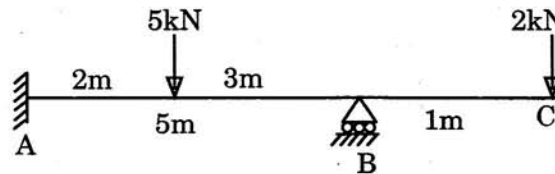
Fig. 1

2. Analyse the beam in Fig. 2 by moment distribution method. Support B settles by 10 mm. Take $EI = 1 \times 10^{12}$ N–mm^2. Draw B.M.D.

Fig. 2

Turn over

3. Find the support moment by theorem of three moments. Assume EI constant throughout.
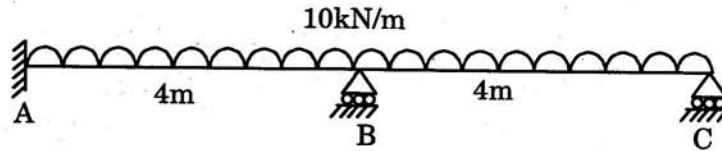

Fig. 3

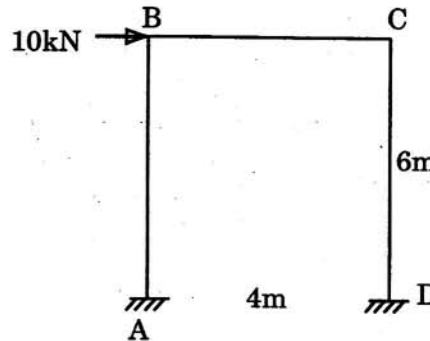4. Analyse the portal frame shown by cantilever method. Columns have same cross-sectional areas.

Fig. 4

5. Find the shape factor for a circular section with diameter 'd'.

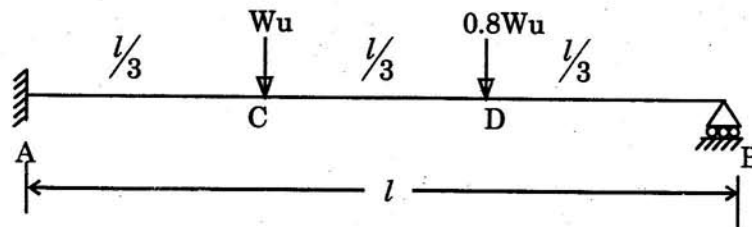6. Find the collapse load for the beam given below (Fig. 5). Assume beam of uniform section.

Fig. 5

(4 × 5 = 20 marks)

Part C

1. Analyse the frame by slope deflection method. Draw B.M.D. EI is constant for all members.
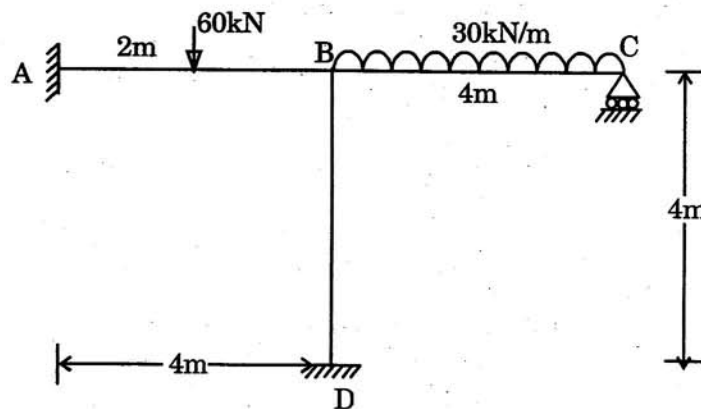

Fig. 6

Or

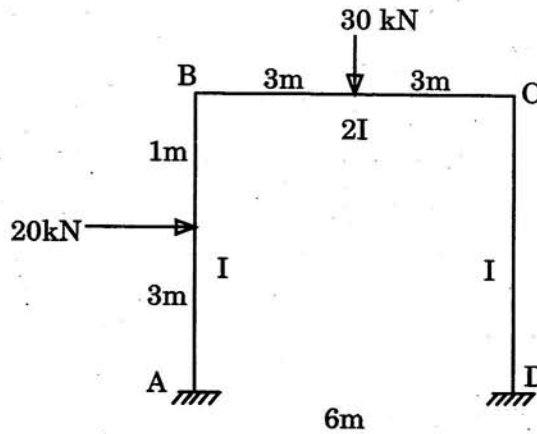2. Analyse by moment distribution method. Draw B.M.D.

Fig. 7

3. Analyse and Draw B.M.D. use Theorem of three moments. Support B sinks by 10 mm. $I = 8000$ cm^4, $E = 2 \times 10^5$ N/mm^2. Beam is of uniform section.
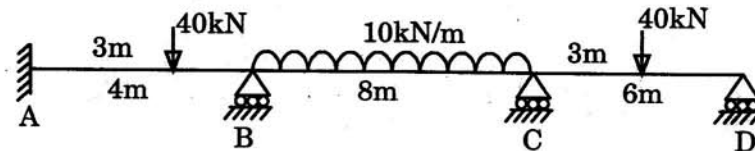

Fig. 8

Or

4. A portal frame having legs 4 m. height is fixed at A and D. Horizontal member BC is having 5 m. length. The moment of inertia of AB and CD is I and that of BC is 2I. BC carries a concentrated load of 20 kN. at a distance of 4 m. from B. Analyse by Kani's method and Draw B.M.D.

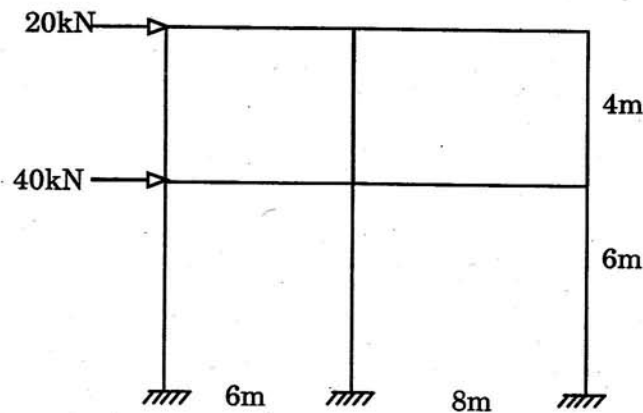5. Analyse the portal frame shown by Portal method. Draw B.M.D.

Fig. 9

Turn ove

Or

6. Analyse the portal frame show in Question 5 by cantilever method. Draw B.M.D. All the columns are of same cross-sectional area.

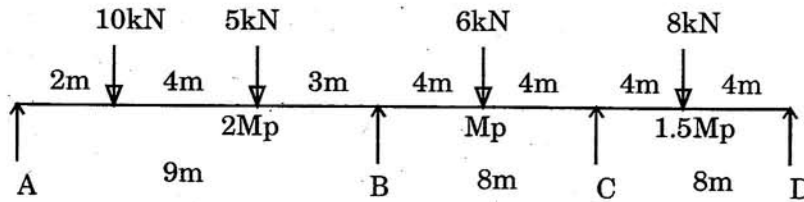7. Find the collapse load factor for the continuous beam ABCD as shown below :

Fig. 10

Or

8. Determine the plastic moment capacity for the frame shown in Fig. 11 below. Assume same section throughout.
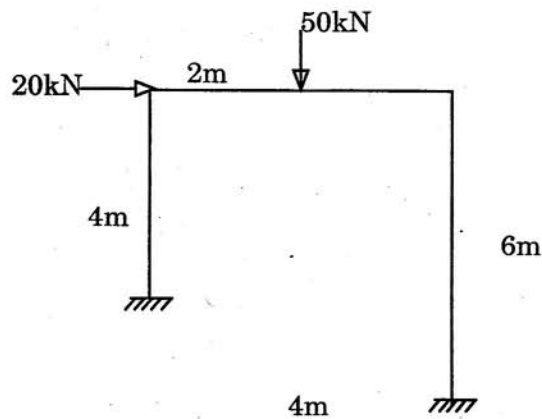

Fig. 11

(4 × 10 = 40 marks)