22402

22223
4 Hours / 70 Marks Seat No.

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

(8) Write answer in sequential order - Preferably.

Marks

1. Attempt any FIVE of the following: **10**

a) Define axial and eccentric load with neat sketch.

b) Define slope and deflection of beam with neat sketch.

c) State effect of continuity for continuous beam.

d) Define carry over factor.

e) Draw neat sketch of perfect truss and redendent truss.

f) Draw stress distribution diagram at base of column if

i) Direct stress is equal to bending stress

ii) Direct stress is less than bending stress

g) State relation amoung bending moment, slope deflection and radius of curvature.

Marks

2. Attempt any THREE of the following: 12

a) Define middle third rule.

b) Calculate the dimensions of core of a section for hollow rectangular section having inside dimension as 300mm×500mm with 50mm wall thickness. Show it on the sketch.

c) A cylindrical chimney is 25m. high. The chimney is of circular section. The external and internal diameter of the chimney are 5m. and 2m. respectively. It is subjected to uniform horizontal wind pressure of 1.2 KN/m^2. If coefficient of wind pressure is 0.6 and specific weight of masonry is $22KN/m^2$. Find the maximum and minimum stresses at base.

d) A rectangular pier 1000mm × 1500mm is subjected to a compressive load 500 KN with an eccentricity of 250mm along the axis bisecting 1000mm side. Find maximum and minimum stresses at base of the pier.

3. Attempt any THREE of the following: 12

a) State the values for maximum deflection of a simply supported beam

i) Carrying central point load 'W' KN.

ii) udl over entire span 'W' KN/m.

b) State two advantages end two disadvantages of fixed beam over simply supported beam.

c) Calculate fixed and moments and draw BMD for a fixed beam 8m. span carries a two point loads of 25KN and 20 KN at 2m. and 5m. from left support.

d) A fixed beam of 4m span carrying udl of indemity 5KN/m over entire span. Calculate the fixed end moments by using first principles.

Marks

4. Attempt any THREE of the following: 12

a) State and explain briefly clapeyron's theorem of three moments.

b) Draw typical deflection curve for a continuous beam as shown in Fig. No. 1

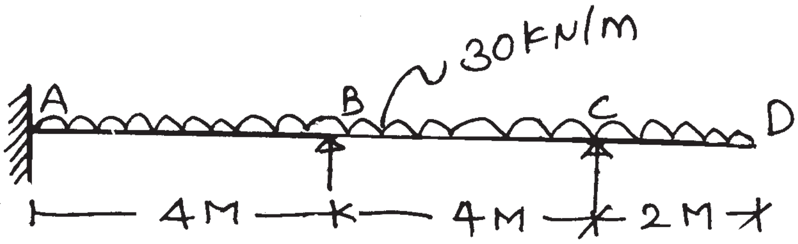

Fig. No. 1

c) Explain the procedure of moment distribution method (MDD)

d) Determine distribution factors at continuity for a continuous beam ABCD which is fixed at A and supported at B, C and D. Take AB=4m, BC=3m and CD=5m. if EI is uniforms.

e) Determine the forces in the member of truss AB, AE, BE and EF with nature for the frame as shown in Fig. No. 2. Tabulate the result.

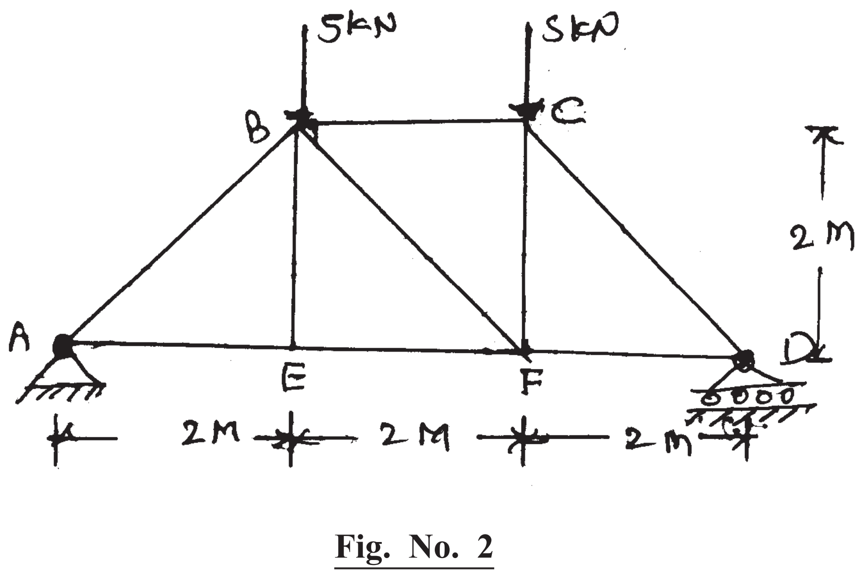

Fig. No. 2

Marks

5. Attempt any TWO of the following: 12

a) A simply supported beam of span 6m carries a udl of 20KN/m over entire span and a point load of 45 KN at 2m from left hand support. Using Macaulay's method, locate the point of maximum deflection and find its value in terms of EI.

b) Two cantilever beams are in Fig. No. 3 contact at their ends and carries udl as shown in Fig. No. 3. Determine the deflection at their point of contact in terms of EI.

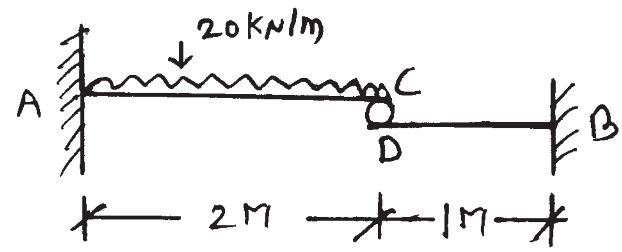

Fig. No. 3

c) Using Clapeyron's theorem, calculate the support moments and draw BMD for beam as shown in Fig. No. 4.

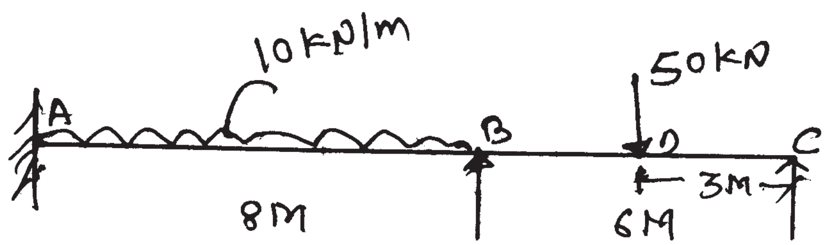

Fig. No. 4

Marks

6. Attempt any TWO of the following: **12**

a) Using moment distribution method, calculate support moments and draw BMD for beam as shown in Fig. No. 5 EI is constant.

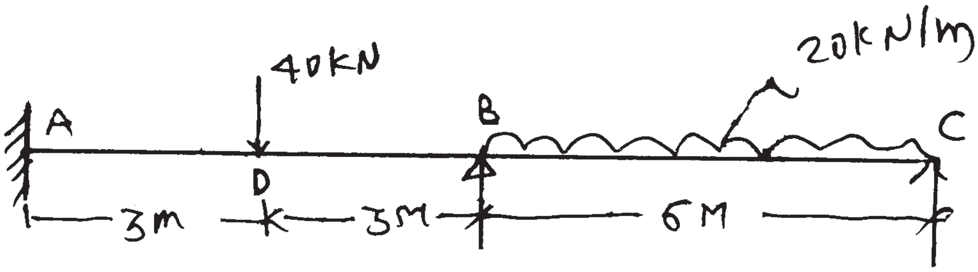

Fig. No. 5

b) Using the method of joints calculate magnitude and state the nature of the forces in the members AB, AE and EB for the frame subjected to load as shown in Fig. No. 6. Tabulate the results.

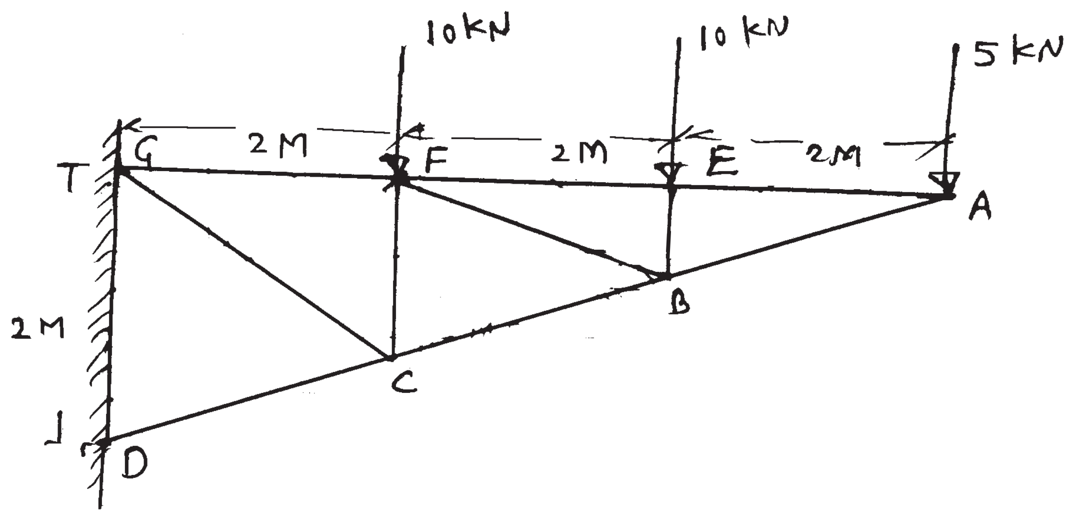

Fig. No. 6

Marks

c) Using the method of sections determine the forces in member AB, FB and AF. Tabulate the results for frame as shown in Fig. No. 7.

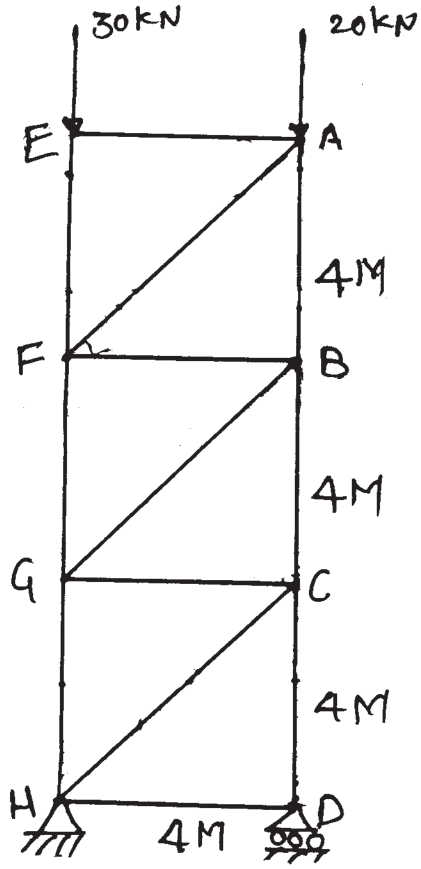

Fig. No. 7
