## 24195

**B.Tech. (Civil) 4th Semester F-Scheme**

**Examination, May-2019**

**STRUCTURAL ANALYSIS-II**

**Paper-CE-202-F**

_Time allowed : 3 hours]_      _[Maximum marks : 100_

_Note :_ (i) Attempt any five questions. **One question from each section is compulsory. Question No. 1 is compulsory.**

    (ii) Each question carries equal marks (20 marks).

    (iii) Assume suitable data if missing.

1.   (a)   Explain how Muller-Breslau principle can be used for drawing influence line.

    (b)   State Castigliano's theorem.

    (c)   Define generalized Slope Deflection equation for a member AB, having Modulus of Elasticity E, Moment of Inertia 1 and span L.

    (d)   Explain space truss.

    (e)   What are the important characteristics of a cable ?        $5 \times 4 = 20$

### Section-A

2. Analyse the frame shown in figure by using Portal method.      20
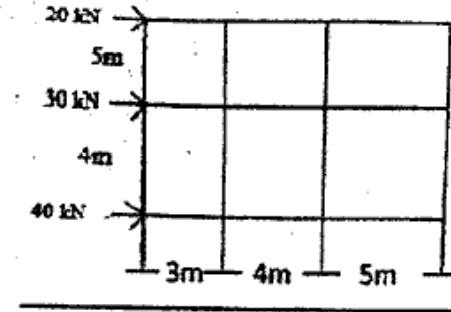


3. Explain Muller–Breslau Principle ? Using the principle draw influence line diagram for reaction at the propped end, moment at the fixed and for a propped cantilever beam of length L.      20
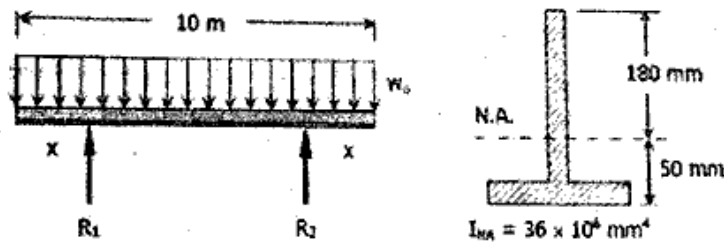
### Section-B

4. A three hinged parabolic arch has a span of 10m. The central rise of the arch is 2m. It is loaded with a uniformly distributed load of intensity 1 kN/m at the left 4m length.      20

    (a)   Calculate the maximum positive and negative bending moments.

    (b)   Calculate the bending moment, normal thrust and shear at 2m and 7.5m form left end.

**5.** A beam ABC 8m long is fixed at A and simply supported at B with an overhang BC 2m long. The beam carries a uniformly distributed load of 12kN/m on AB and a point load of 12kN at C. Find the support moments and the support reaction and draw BMD and SFD.                    **20**

### Section-C

**6.** A cast-iron beam 10m long and supported as shown in Fig. P-557 carries a uniformly distributed load of intensity $w_0$ (including its own weight). The allowable stresses are $f_{bt} \leq 20$ MPa and $f_{bc} \leq 80$ MPa. Determine the maximum safe value of $w_0$ if x=1.0 m.                    **20**



**7.** A cable is used to support five equal and equidistant loads over a span of 40m. Find the length of the cable required and its sectional area if the safe tensile stress is 150 N/mm². The central dip is 3.0m and loads are 6kN each.  https://www.haryanapapers.com                    **20**

### Section-D

**8.** The structure in Fig is a truss which is pinned to the floor at point A, and supported by a roller at point D. Determine the force to all members of the truss by method of section.                    **20**
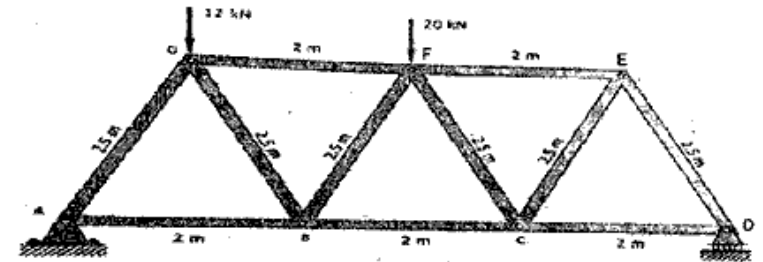


**9.** The roof truss shown in Fig. is pinned at point A, and supported by a roller at point H. Determine the force in member DG by method of Joint.                    **20**