

BT-5 / D-17
STRUCTURAL ANALYSIS-III
Paper-CE-301 E

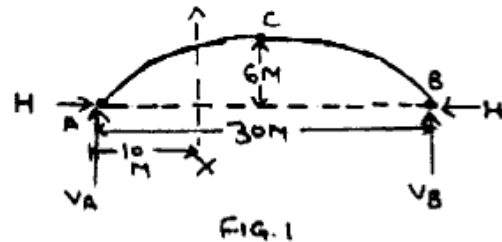
Time allowed : 3 hours]

[Maximum marks : 100

- Note :** (i) Attempt any five questions, selecting at least one question from each unit.
(ii) All questions carry equal marks.

Unit-I

1. A parabolic arch hinged at its springs and crown has a span of 30m and central rise of 6m. Determine the magnitude of maximum positive and negative bending moment at a section 10 m from left hand support, when a point load of 90 kN rolls over the beam as shown in fig. 1. 20



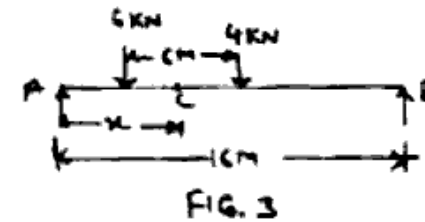
2. For a span shown in fig. 2 below, obtain the bending moment at a section 'X', 20 m from A due to the loads in position indicated. Also determine the position of loads for

maximum bending moment section 'X' and the value of maximum moment. 20

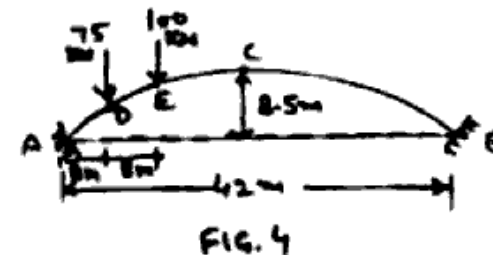


Unit-II

3. Two point loads 4 kN and 6 kN are spaced 6m apart crosses a girder of 16m span, the 4 kN load leading from left to right. Construct the maximum shear force and bending moment diagram stating the absolute maximum values. Refer fig. 3. 20

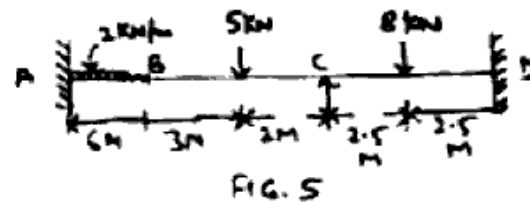


4. A parabolic arch fixed at both ends has a span of 42m and central rise of 8.5m. It is subjected to concentrated loads of 75 kN and 100 kN at 8m and 16m from left hand support. The moment of inertia of the arch rib varies as the secant of the inclination of the arch rib axis. Analyse the arch and find the bending moment at either support at the crown Refer fig. 4. 20



Unit-III

5. A continuous beam ABCD consists of three spans and is loaded as shown in fig. 5. Ends 'A' and 'D' are fixed. Determine the B.M. at the supports using Kani's method. Also, plot the B.M.D and deflected shape of beam.



6. A continuous beam shown in fig. 6 has rigidly fixed ends 'C' and 'D' is pinned at 'E' and has rigid joints at 'A' and 'B'. The members are of uniform sections and material throughout. Sketch BMD for frame showing all important values. Also find the values of horizontal and vertical reactions at 'D' and 'E'. Use Kani's method.

