S.No. : 361 **BCE 3401**

No. of Printed Pages : 06

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 33115	Roll No.									

B. Tech. Examination 2021-22

(Even Semester)

STRUCTURAL ANALYSIS - I

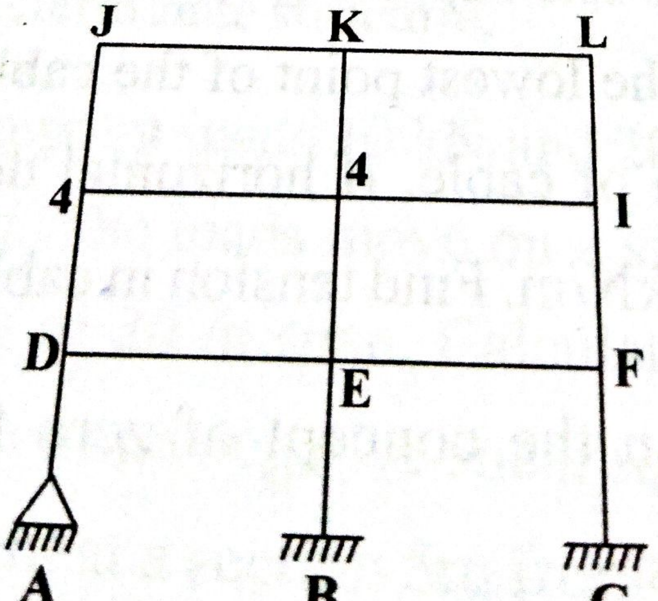
Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION–A

1. Attempt all parts of the following : $8\times1=8$

(a) Find static indeterminancy of following frame :



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(b) What do you mean by tension coefficient method?

(c) Define conjugate beam.

(d) State Castigliano's theorem.

(e) What do you mean by strain energy?

(f) What is influence line diagram?

(g) Three hinge arch is a determinate structure why?

(h) Define spandrel arch.

SECTION – B

2. Attempt any two parts of the following : 2×6=12

(a) A foot bridge is carried over a river of span 90 m. The support are 3 m and 12 m higher than the lowest point of the cable. Determine length of cable. If horizontal deck is located by 20 kN/m. Find tension in cable.

(b) Explain the concept of zero force members in truss.

(c) A cantilever beam of span 2 m and is subjected to a concentrated load of 20 kN at the tree end. The cross section of the beam is 100 × 200 mm and E = 30 kN/mm². Calculate the slope and deflection of the beam at mid span.

(d) What do you mean by theoretical arch? Also write down and prove Eddy's theorem.

SECTION – C

Note :– Attempt all questions. Attempt any two parts from each questions. 5×8=40

3. (a) Define expression of horizontal thrust and length of cable carrying UDL throughout the span.

(b) Explain with example determinate and indeterminate structure.

(c) Two point loads 10 kN and 20 kN spaced 3m apart. The loads move on a simply supported beam of 20 m span. Calculate the maximum positive and negative shear force and bending moment at a section 5m from the left support.

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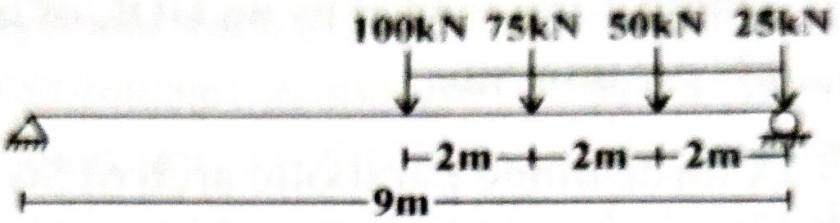

(c) The span of parabolic three hinge arch is 40 m it rise is 10m. Draw ILD for the following :

(i) Horizontal thrust

(ii) Bending moment at 8m from left support

(iii) Normal thrust at the above section

(iv) Radial shear at the above section

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