Exam Date & Time: 02-May-2019 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENES IV SEMESTER B.Sc.(Applied Sciences) IN ENGINEERING END SEMESTER THEORY EXAMINATION-APRIL/MAY 2019

ANALYSIS OF INDETERMINATE STRUCTURES [ICE 245 - S2]

Marks: 100

Duration: 180 mins.

Answer 5 out of 8 questions.

1)

A two hinged parabolic arch of span 20m and rise 4m carries two concentrated loads of 30 (20) kN each at the crown and at the left quarter span section. Find the horizontal thrust at each support and the bending moment at loaded section.



2)

A continuous beam ABC consists of two consecutive spans AB and BC 4 metres each and ⁽²⁰⁾ carrying a distributed load of 60 kN/m. The end A is fixed and end C is simply supported. Using theorem of three moments, find the support moments and the reactions.



³⁾ Determine the support moments for the continuous girder shown in the figure by slope deflection method ⁽²⁰⁾ if the support B sinks by 2.5 mm. For all members take I = 3.5×10^7 mm⁴ and E = 200 kN / mm².



Analyse the frame shown in the figure by moment distribution method.

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Find the moments at the supports of the continuous beam shown in the figure by Kani's method. The beam is of uniform section.



6)

(10) The load system shown in the figure moves from left to right on a girder of span 10m. Find the absolute maximum bending moment for the girder.

A)



B)

figure. Find the maximum positive and negative bending moments that can occur at the section C using Influence Line Diagram.



Briefly explain different types of arch.

7)

- A) B)
- Derive an expression for a fixed end moments of a fixed beam carrying a concentrated load ⁽¹²⁾ 'w' as shown in the figure.



⁸⁾ For the beam section shown in the figure determine the shape factor and the fully plastic (12) A) moment. Take $f_y = 250 \text{ N/mm}^2$.



(8)

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