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B

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER M.TECH DEGREE EXAMINATION, DECEMBER 2017
Branch: Civil Engineering

Stream: Structural Engineering

01 CE 7117 Stability of Structures

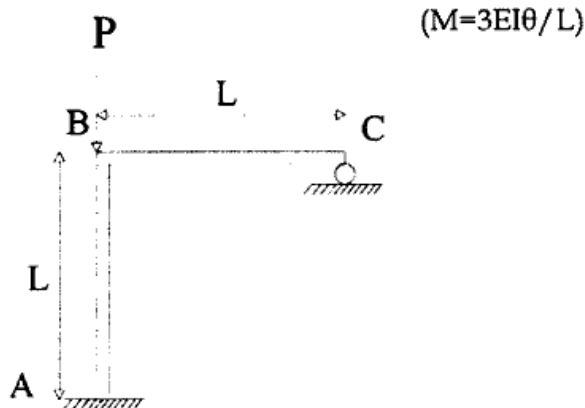
Answer any two full questions from each part
Limit answers to the required points.

Max. Marks: 60

Duration: 3 hours

PART A

1. a. Write the second order differential equation for buckling and solve for the exact characteristic equation which defines the critical load. No need to find the critical load 9 Marks



2. a. Explain the buckling phenomenon of columns. What is column design curve?. What are its advantages? 6 Marks
- b. Explain the behaviour of initially bent columns 3 Marks
3. a. Explain the Double Modulus and Tangent modulus theory for inelastic buckling of columns 9 Marks

PART B

4. a. Obtain critical load for a hinged hinged column using matrix stiffness method 9 Marks

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|----|----|--|---------|
| 5. | a. | Explain the effect of shear on critical loads | 5 Marks |
| | b. | Explain buckling of built up columns | 4 Marks |
| 6. | a. | Derive the load deflection relation for a beam- column within elastic limit.
Explain the interaction equations for design of beam-columns | 9 Marks |

PART C

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|----|----|--|----------|
| 7. | a. | Explain post buckling behaviour of axially compressed plates. | 3 Marks |
| | b. | Explain non-uniform torsion. Derive the strain energy expression for non-uniform torsion. Give the different buckling modes and critical load values for a section with two axis of symmetry | 9 Marks |
| 8. | a. | Obtain the critical load of a laterally unbraced frame using neutral equilibrium method. | 9 Marks |
| | b. | Explain lateral buckling of beams | 3 Marks |
| 9. | a. | Give the differential equation of plate buckling. Hence obtain the critical buckling load for a rectangular plate fixed along all edges. | 12 Marks |

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