Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: CE303

Course Name: STRUCTURAL ANALYSIS -II

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks Marks

1 a) Explain the term static indeterminacy with two examples. (5)

b) Analyse the continuous beam shown in fig.1 by Three moment equation and draw the BMD and SFD. Given EI = 3200 kNm^2. (10)

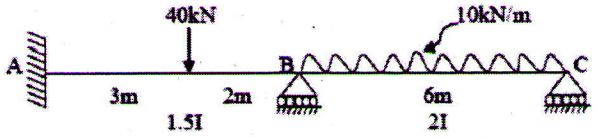

Fig.1

2 a) Explain how the effect of settlement of support is taken care of while analyzing the continues beams using slope deflection method. (5)

b) Analyse the continuous beam shown in fig.2 by slope deflection method and draw the BMD. (10)

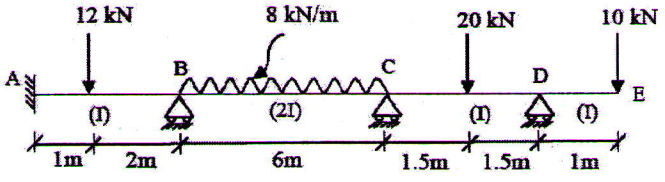

Fig.2

3 a) Derive the Clapeyron's theorem of three moments. (7)

b) Analyse the frame shown in fig.3 by slope deflection method and draw the BMD. Moment of inertia for all the members are same. EI = 3000 kNm^2. (8)

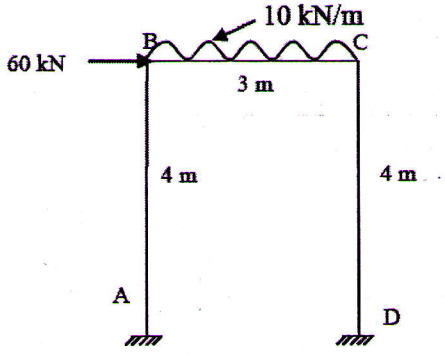

Fig.3

PART B

Answer any two full questions, each carries 15 marks

4 a) Define the following terms: (5)
i) Carry over moment ii) Carry over factor iii) distribution factor

b) Analyse the rigid frame shown in fig.4 by moment distribution method and draw the BMD. (10)

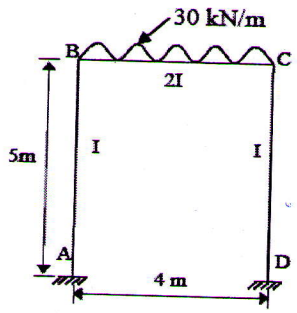

Fig.4

5 a) Differentiate between rotational factor and rotation contributions. (5)

b) Analyse the continuous beam shown in fig.5 by Kani's method and draw the BMD. (10)

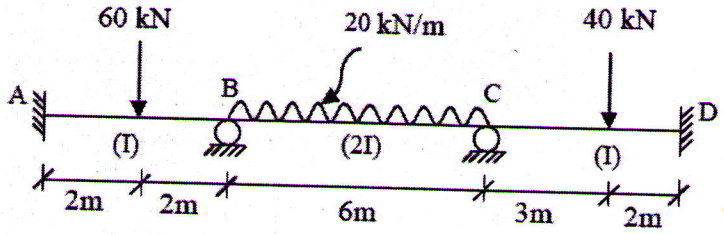

Fig.5

6 a) Describe the procedure for analysis of indeterminate structures by Kani's method. (5)

b) List out the situations that causes sway in portal frames with neat sketches. (4)

c) Explain the procedure to be followed for the analysis of rigid frames with sway by method of moment distribution. (6)

PART C

Answer any two full questions, each carries 20 marks

7 a) List out the circumstances where curved beams are provided. (4)

b) Discuss the different types of forces developed in a curved beam. (6)

c) Derive an expression for deflection at the free end of a quarter circle beam of radius R carrying a vertical load P at its free end. Sketch the shear force, bending moment and its torsional moment diagrams. Assume flexural rigidity (EI) = torsional rigidity (GJ). (10)

8 a) What are the assumptions made in theory of plastic analysis? (5)

b) Derive an expression for collapse load for a simply supported beam of span L carrying a concentrated load of W at centre by static and kinematic method. (5)

c) Calculate the plastic moment carrying capacity required for the continuous beam with the working loads as shown in fig.6. Take load factor =1.5 (10)

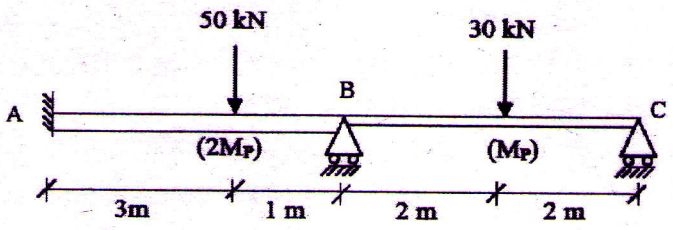

Fig.6

9 a) Define shape factor. Also derive the shape factor for a rectangular section with breadth 'b' and depth 'd'. (6)

b) Define the following terms: (4)
i) Load factor ii) Plastic modulus iii) Plastic hinge

c) A beam shown in fig.7 is semi-circular in plan supported on three equally spaced supports. The beam carries a uniformly distributed vertical load of w/unit of the circular length. Analyse the beam and sketch the bending moment and twisting moment diagrams. (10)

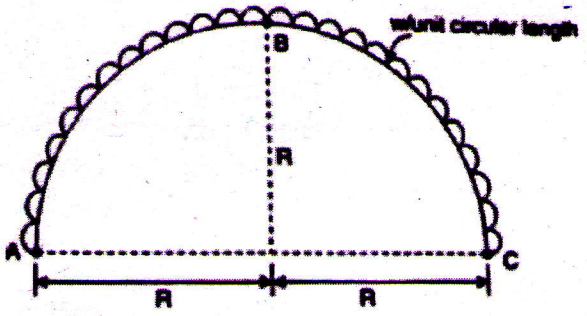

Fig.7

****