Reg No:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: CE303
Course Name: STRUCTURAL ANALYSIS -11

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any two full questions, each carries 15 marks.   Marks

1   Analyse the three-span continuous beam ABCD, with overhang DE, for the loading,   (15)
     end support conditions, spans and flexural rigidity as shown in Fig. 1, by applying
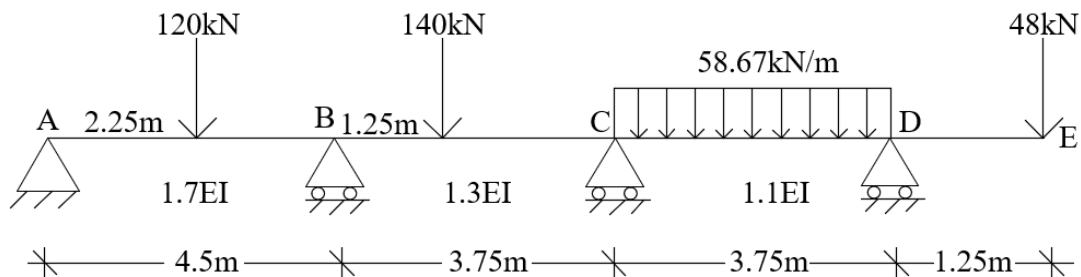   the theorem of three moments. Draw the BMD and SFD.

Fig. 1

2 a) Differentiate between force and displacement methods of analyses. Give one   (3)
        example for each case.
   b) Determine the moments at A, B and C using slope deflection method for the frame   (12)
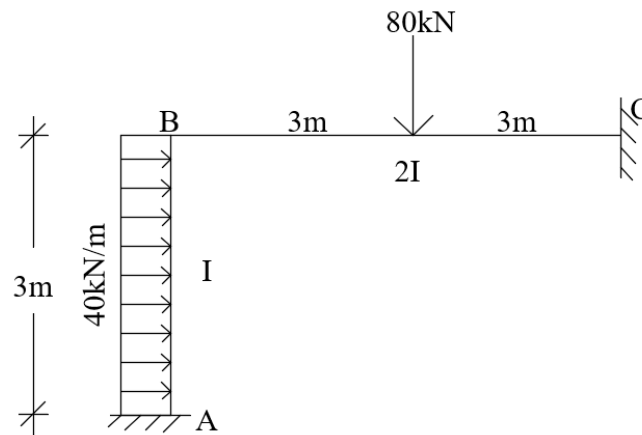   shown in Fig 2. Draw the BMD.

Fig. 2

3 a) What are the reasons for sway in frames?   (4)

    b) Set up the slope deflection equations for a beam considering support settlement.   (4)

    c) Write down the analysis procedure of a continuous beam ABC fixed at the ends A   (7)
and C by three moment equation. Roller support is provided at B. Moment of inertia
and span length of AB and BC are I_1, L_1 and I_2, L_2. Span AB carries UDL and span
BC supports a central concentrated load.

PART B
Answer any two full questions, each carries 15 marks.

4   Analyse the continuous beam shown in Fig. 1 by moment distribution method. Draw   (15)
BMD and SFD

5   Analyse the frame in Fig. 2 by Kani's method. Draw BMD.   (15)

6 a) Formulate Kani's analysis procedure using a prismatic beam element AB having   (10)
length l and flexural rigidity EI

    b) Differentiate distribution factor and rotation factor in structural analysis.   (5)

PART C
Answer any two full questions, each carries 20 marks.

7 a) Explain the following terms.   (8)
(i) Plastic hinge (ii) Load factor (iii) Shape factor (iv) Plastic Moment

    b) Determine the shape factor of a circular section with diameter D.   (6)

    c) Locate the plastic hinges in a propped cantilever beam carrying UDL.   (6)

8 a) Determine the collapse load for the fixed beam AB of span L. At point C, 0.2L   (10)
distance from the left support A, there is a concentrated load of 1.25 W and another
concentrated load of W is acting at point D which is 0.25L from the support B. The
plastic moment of resistance of the beam is Mp.

    b) Determine the deflection at free end of a beam in the shape of a quadrant of a circle   (10)
in plan, fixed at one end and free at the other, with a point load at the free end.

9   Determine the expression for bending moment and twisting moment for circular ring   (20)
beam supported by a no: of columns placed at regular intervals.

****