Registration no: | | | | | | | | | | |

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B.Tech
PCCI4304

6th Semester Regular / Back Examination 2015-16
STRUCTIRAL ANALYSIS - II
BRANCH: CIVIL
Time: 3 Hours
Max Marks: 70
Q.CODE: W116

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: **(2 x 10)**

a) In slope deflection method of analysis, what condition is considered in a middle support to develop an equation?

b) Draw a figure for a frame , which does not have any sway, when subjected to lateral loading.

c) Draw a figure and explain the terms: *carry over moment* and *carry over factor*.

d) Distinguish between *stiffness* and *relative stiffness*.

e) Define *flexibility* of a structure. State the relationship between flexibility and stiffness of a structure.

f) Draw a two span continuous beam with both ends fixed and state the general equation to get the resultant moment at extreme left end as per Kani's method of analysis.

g) Define R F. What is the sum of R Fs at a joint.

h) Draw the figure for a two hinged arch subjected to external loading and show the reactions developed. Find the degree of indeterminacy of this structure.

i) Define the element K_{ij} in a stiffness matrix of size nxn.

j) What do you mean by *shape factor*? What is the value of shape factor for a rectangular section?

Q2 A continuous beam ABC has two spans, AB = 4m, BC = 6m.It has a overhanging portion of 2m at C and the end A is fixed. On AB a point load of 20 KN acts at the center. On BC a uniformly distributed load of 8 KN/m acts throughout the span. At 2m from C a load of 20 KN is acting. Analyse the beam by slope deflection method. Draw the B M D. **(10)**

$E = 200 \times 10^6$ KN/m^2 , $I = 100 \times 10^6$ m^4

Q3 A continuous beam ABC has two spans AB = 6m and BC = 6m. Both the beams are hinged at ends and carry uniformly distributed load of 5 kN/m in each span. The moments of inertia of each span is 2I. Analyse the beam using moment distribution method and draw the bending moment diagram. . **(10)**

Q4 A fixed beam ABC has two spans. AB=5m and BC=4m. The end A is fixed and C is hinged. A point load of 10 KN acts at centre of the span, AB and on BC, a udl of 5KN/m acts throughout the span. Analyse the beam using moment distribution method. **(10)**

Q5 A two span continuous beam, ABC is fixed at A and hinged at C. AB is 5 m and BC is 8 m long. If at B, the coordinate direction is 1 and at C, the coordinate direction is 2, develop the 2x2 stiffness matrix. AB span is having the twice EI value of span, BC. **(10)**

Q6 A two hinged parabolic arch of span, 20 m and rise of 5 m carries a point load of 50 kN at centre of the arch. The moment of inertia varies as the secant of the slope. Find the horizontal thrust and maximum positive and negative moments in the arch. Draw the B M D. **(10)**

Q7 A propped cantilever of span, 5 m is subjected to a uniformly distributed load of 8 kN/m. If the plastic moment capacity of the beam is M_P, find the collapse load based on basic principle. Draw the bending moment diagram. **(10)**

Q8 Write short notes on any **two**: **(5 x 2)**

a) Bending stress distribution in a rectangular section subject to plastic moment

b) Force method of analysis and displacement method of analysis

c) Total strain energy stored in a two hinged arch

d) Distribution factor