Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PCCI 4304 (New)

Sixth Semester (Back) Examination – 2013

STRUCTURAL ANALYSIS – II

BRANCH : CIVIL

QUESTION CODE : B319

Full Marks – 70

Time : 3 Hours

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

1. Answer the following questions : 2×10

(a) Why *limit analysis* of structure is preferred to elastic analysis ?

(b) Define *ductility*.

(c) Define *load factor*.

(d) What do you mean by a *mechanism* ?

(e) State *distribution theorem*.

(f) Define *plastic hinge*.

(g) A continuous beam ABC has two spans AB = 5 m, BC = 4 m. A point load 100 KN acts at the centre of the AB, where as a u.d.l of 25 KN/m acts throughout BC. End A is fixed, C is simply supported. $I_{ab} : I_{bc} = 3 : 1$. Find the distribution factor for the members.

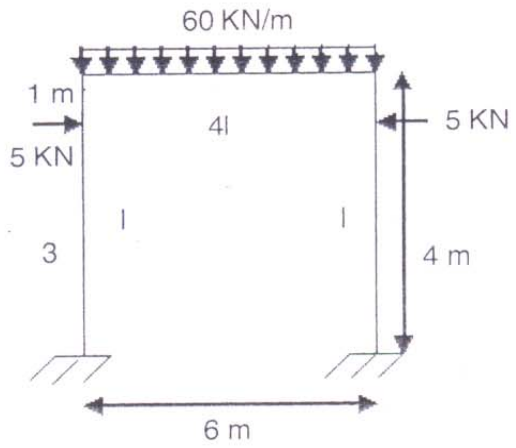
(h) Write the generalized slope deflection equation for a continuous beam.

(i) Find the *shape factor* for a rectangle.

(j) Explain *virtual work* principle.

P.T.O.

2. Analyse the portal frame shown in figure using moment distribution method. 10



3. A fixed beam ABC has two spans AB = 6 m and BC = 4 m. A UDL of 30 KN/m actson span AB. On BC, a point load of 20 KN acts at 1 m from B. Analyse the beam using slope deflection method. Also draw the bending moment diagram. 10

4. Find the shear shape factor for a hollow rhombus. 10

5. (a) Compute the plastic section modulus, elastic section modulus for a box section with outside depth 30 cm, wall thickness 1 cm and width 15 cm. 5

   (b) Compute the shape factor for the above section. Find the plastic moment Mp, if the yield stress is 2500 kg/cmsq. 5

6. A continuous beam ABCD has three spans, AB = 3 m, BC = 4 m, CD = 4 m. And A is simply supported and D is fixed. A point load of 10 KN acts at 1 m from A on span AB. On BC a udl of 5 KN/m acts. On span CD a point load of 20 KN acts at the center. $I_{ab} : I_{bc} : I_{cd} = 1.5 : 2 : 1$. Determine the support moments at A, B, C, D using Kani's method. 10

7. (a) Draw the schematic diagram of a *suspension bridge*. 4

   (b) Find the expression for horizontal tension in a cable. 6

8. Write notes on : 2.5×4

   (a) Plastic moment

   (b) Stiffness and flexibility

   (c) Degree of redundancy

   (d) Two hinged arch.
