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

Total Number of Pages : 02 **B.Tech.**
PCCI4304

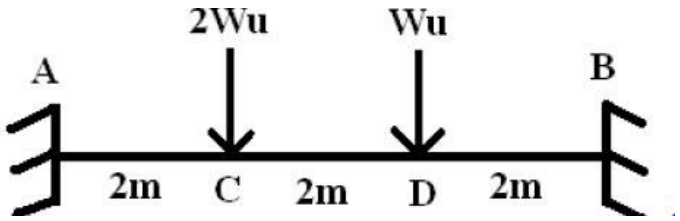
6th Semester Back Examination 2017-18
STRUCTIRAL ANALYSIS - II
BRANCH : CIVIL
Time : 3 Hours
Max Marks : 70
Q.CODE : C209

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

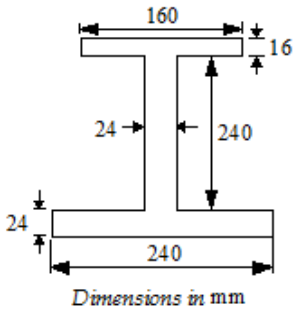
Q1 **Answer the following questions:** **(2 x 10)**

a) Define the collapse load and load factor.
b) What are the assumptions made in plastic analysis of structures?
c) Define kinematic indeterminacy or Degree of Freedom.
d) Write the element flexibility matrix for a truss member & for a beam element.
e) A T-section consists of 20 mm web and 20 mm thick flange. Depth of the web is 180 mm. Width of the flange is 120 mm. find the shape factor based on Plastic analysis.
f) Compare flexibility method and stiffness method.
g) Name the different types of arches.
h) What is meant by Distribution Factor?
i) Give the relative stiffness when the far end is (a) simply supported and (b) fixed.
j) Write the general slope deflection equation and mention what each term represents.

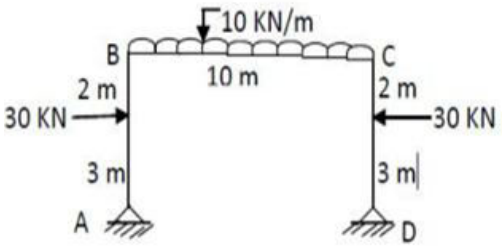
Q2 Calculate the collapse load for the fixed beam shown with Mp = 100 kNm. **(10)**



Q3 **a)** Define shape factor and load factor. Derive the same for a rectangular section. **(4)**
b) Find the shape factor for the unsymmetrical I beam shown in figure. **(6)**



Q4 Analyze the structure shown in figure using Kani's method and draw BMD. **(10)**



Q5 A continuous beam ABCD consists of three spans AB= 6m, BC= 5m CD= 5m. Span AB is loaded with an udl of 2kN/m ,BC with a point load of 5 kN at a distance of 3m from B, and CD with a point load of 8 KN at a distance of 2.5 m from C. Ends A and D are fixed. Determine the bending moments at the supports and plot the bending moment diagram.(Slope deflection method) **(10)**

Q6 A two hinged circular arch of span 20 m and rise 4 m is loaded with a uniformly distributed load of 100kN/m over the left half span and a concentrated load of 80 kN at the midpoint of the right half of the arch. Calculate the horizontal reaction and normal thrust at a section just to the right of concentrated loads. **(10)**

Q7 A two span continuous beam ABC rests on simple supports at A,B and C. All the three supports are at same level. The span AB=7m and span BC=5m. The span AB carries a uniformly distributed load of 30kN/m and span BC carries a central point load of 30kN. EI is constant for the whole beam. Find the moments and reactions at all the support using flexibility method. **(10)**

Q8 **Write short answer on any TWO :** **(5 x 2)**

a) Lower bound theorem
b) Redundant plane truss
c) relation between flexibility and stiffness matrix
d) carry over moment and distribution factor