Code 05

CIVIL ENGINEERING

Time : 3 Hours

Maximum Marks : 150

Note : Attempt FIVE questions in all. All questions carry equal marks. Question No. 1 is compulsory. Answer two questions from Part - I and two questions from Part - II. The parts of the same question must be answered together and must not be interposed between answers to other questions.

1.   Attempt any four of the following : $(4 \times 7\frac{1}{2} = 30)$

a)   A simply supported beam AB has a span L. A clockwise bending moment 'M' acts at point A while an equal moment, but in anticlockwise direction, acts at point B of the beam. Draw the bending moment and shear force diagrams for the beam. Show the values on the diagrams.

b)   A simply supported beam MN, of span 'L', has a section C, 'L/4' from the left support. A moving uniformly distributed load of length 'L/3' passes over the beam. Explain how the load should be placed so as to get the maximum bending moment at C.

c)   Write any three assumptions taken while designing riveted joints of steel.

d)   Draw sketches to show actual and idealized velocity distributions for water flowing in a pipe.

e)   What do you understand by balancing of a survey traverse? Enlist different methods for balancing a traverse.

f)   What do you understand by a 'Hydrograph'? What is its use?

PART - I

2. a) What do you understand by equivalent length of a column? Explain how it varies for columns having different end conditions, giving examples.   (15)

   b) Show the variation of shear stresses in a cross section of a circular shaft which is subjected to axial torsion. Write the expression to calculate shear stresses.   (15)

3. a) Explain the procedure of design of lacing in a built-up steel compression member.   (15)

b)   What is a Cipolletti weir? Explain with a neat sketch.   (15)

4.   a) Will it be easier to swim in a fresh water or in a sea water? Why?
         In which case will it be easier to float?   (15)
     b) What do you understand by shallow foundations and deep
     foundations? Give their examples and draw neat sketches.   (15)

PART - II

5.   a) Explain two point problem of plane table surveying with the
         help of a neat sketch.   (15)
     b) What do you understand by characteristic strength of concrete?
         Discuss any one method for determining tensile strength of
         concrete.   (15)

6.   a) Explain differences between CPM and PERT.   (15)
     b) What are different types of sleeper used in railways? Explain any
         one of them in detail.   (15)

7.   a) Write short notes.
         (i) Aquifers
         (ii) Spillway types
         (iii) Trickling filters   (3x5=15)
     b) What are different measures adopted to improve the bearing
         capacity of weak soils?   (15)