

CIVIL ENGINEERING

1. Attempt any four of the following:

(4x7.5=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)