No. of Printed Pages : 5 **BAR-034**

BACHELOR OF ARCHITECTURE (BARCH)

Term-End Examination

June, 2013 00094

BAR-034 : THEORY OF STRUCTURES-IV

Time : 3 hours *Maximum Marks : 70*

Note : *Question no. 1 is **compulsory**. Answer **any four** questions from the remaining questions. Use of IS : 800-2007 and steel table are permitted. Assume **any** missing data suitably.*

1. Choose the most appropriate answer from the options given in questions (a) to (g). **7x2=14**

(a) Degree of static indeterminacy of a fixed beam with an internal hinge is :

(i) One

(ii) Two

(iii) Three

(iv) Four

(b) Two hinged arch is :

(i) a determinate structure

(ii) an indeterminate structure

(iii) an unstable structure

(iv) nothing can be said

(c) A portal frame is subjected to windload. Its columns will be subjected to :

(i) Axial compression, shear force and bending moment

(ii) Axial tension, shear force and bending moment

(iii) Axial tension or compression, shear force and bending moment

(iv) Axial tension, axial compression and shear force

(d) The bending moment in an arch of shape of the funicular polygon, for the given loads, shall be :

(i) zero at crown

(ii) zero everywhere

(iii) maximum at span/7 distance from support

(iv) nothing can be said

(e) The method of moment distribution in structural analysis is :

(i) An approximate method

(ii) An exact one

(iii) An iterative method

(iv) nothing can be said

(f) The effective throat thickness of a fillet weld is :

(i) 0.707 times the size of the weld

(ii) function of the angle between fussion faces

(iii) equal to the size of fillet weld

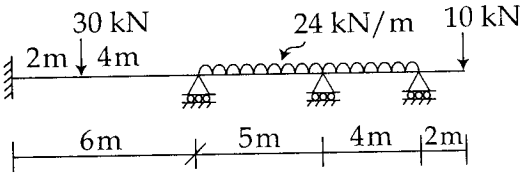
(iv) 0.8 times the size of the weld

(g) Which of the following are normally subjected to axial thrust ?

(i) column (ii) arch

(iii) beam (iv) column and arch

2. Analyse the continuous beam shown in figure and draw SFD and BMD. **14**



EI = Constant

Figure - 1

3. A three hinged parabolic arch, shown in figure 2 has a span of 20m and central rise of 5m. It carries a concentrated load of 100 kN at a distance of 5m from the left support. Determine the maximum bending moment and plot the bending moment diagram. **14**

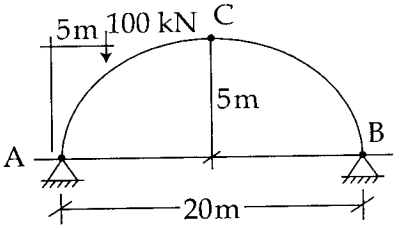


Figure - 2

4. A built-up column consists of ISHB 300 having two plates, each of 8mm thickness, attached to each flange so as to have equal resistance about either axis. Determine the load, the column can safely carry over a length of 4.5 m with both end hinged. Take fy = 300 N/mm^2. 14

5. Write short notes on **any two** of the following : **2x7=14**

(a) Advantages of steel structure over R.C.C. structure

(b) Failure of rivetted/bolted connections

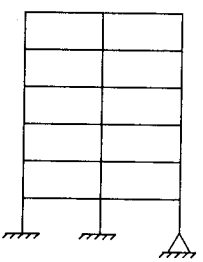
(c) Steps in design of tension members

6. (a) Two plates of size 250mm × 10mm and 250mm × 12mm are to be joined by a lap joint. Design the fillet weld for the full strength of the joint. Take permissible tensile stress in plate = 150 N/mm^2 and permissible stress in weld material = 102.5 N/mm^2 7

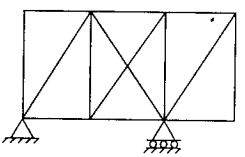
(b) Discuss advantages and disadvantages of indeterminate structures. 7

7. Find degree of static Indeterminacy of frames given in Figure 3. 7x2=14

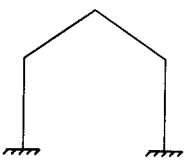
(a)



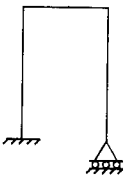
(b)



(c)



(d)



(e)

(f)

(g)

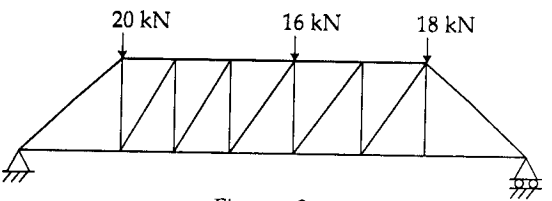


Figure - 3