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BAR-034

BACHELOR OF ARCHITECTURE (B.Arch.)

Term-End Examination

00313

June, 2018

BAR-034 : THEORY OF STRUCTURES – IV

Time : 3 hours *Maximum Marks : 70*

Note : *Question no. 1 is **compulsory**. Attempt any **four** questions from the remaining. Use of scientific calculator, IS : 800 code and steel tables is permitted.*

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1. Choose the most appropriate answer from the given options in questions (a) to (g) below : *7×2=14*

(a) Thin or slender structural members may be more easily used in

(i) determinate structures

(ii) indeterminate structures

(iii) unstable structures

(iv) stable structures

(b) For a two-dimensional structure, possible number of reactions for a fixed support is

(i) 3

(ii) 1

(iii) 6

(iv) 8

(c) Flexural stiffness of a beam section is affected by

(i) Young's modulus of the material

(ii) lateral dimensions of beam

(iii) magnitude of external loads

(iv) first two options above

(d) A three-hinged arch is

(i) a determinate structure

(ii) an indeterminate structure

(iii) an unstable structure

(iv) just like a simply supported beam with an internal hinge

(e) Buckling may take place in

(i) short columns

(ii) long columns

(iii) both short and long columns

(iv) short columns and long beams

(f) Due to horizontal forces, a column in a portal frame may be subjected to

(i) shear force only

(ii) shear force and bending moment

(iii) shear force, axial force and bending moment

(iv) only bending moment

(g) Speed of construction may be improved in the case of connections which are

(i) riveted

(ii) bolted

(iii) welded

(iv) either riveted or bolted

2. (a) What do you understand by efficiency of an arch ? Explain briefly. 7

(b) Compare steel and concrete as a structural materials. 7

3. Draw the BM and SF diagrams for the beam ABC, shown in figure 1, using moment distribution method. Moment of inertia of span AB and BC are 2I and I respectively. 14

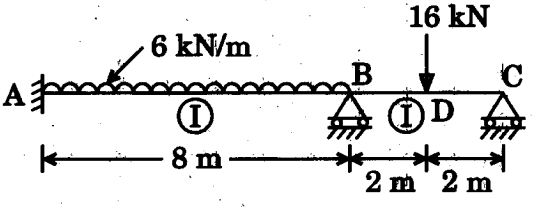

Figure 1

4. (a) Determine indeterminacy of the beam ABC shown in figure 1. 7

(b) Compare an arch to a beam as a structural member, its load carrying mechanism and type of internal forces developed. 7

5. (a) Write assumptions in the theory of riveted joints. 7

(b) Write advantages of welding in steel construction. 7

6. (a) Give design steps for a steel built-up column using IS-800. 7

(b) Write a classification of welds. Draw neat sketches of the various types given in the classification. 7

7. Write short notes on the following : *2×7=14*

(a) Lateral buckling of steel built-up beams

(b) Lap joint and Butt joint