No. of Printed Pages : 4

BAR-034

BACHELOR OF ARCHITECTURE (B.Arch.)

Term-End Examination

December, 2018

00483

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.*

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

(a) Indeterminacy of a structure depends on

(i) number and type of supports provided

(ii) material of construction

(iii) external loads applied

(iv) All of the above

(b) A three-hinged arch is

(i) determinate

(ii) indeterminate

(iii) redundant

(iv) unstable

(c) Joints in steel portal frames are

(i) pin jointed

(ii) rigid

(iii) weak so that they fail before members

(iv) strong pin jointed

(d) An internal hinge in a beam span may transfer

(i) shear force only

(ii) shear force and bending moment

(iii) bending moment only

(iv) shear force and axial force

(e) A definite load path is provided in

(i) determinate structures

(ii) indeterminate structures

(iii) unstable structures

(iv) All of the above

(f) Rivets may be subjected to double shear in a

(i) Lap joint

(ii) Butt joint

(iii) Both of the above

(iv) None of the above

(g) Which of the following is a ductile material ?

(i) Brick

(ii) Stone

(iii) Steel

(iv) Glass

2. (a) Discuss briefly, how a riveted steel joint may fail. 7

(b) Describe the design procedure of a riveted joint subjected to axial load. 7

3. Analyse the continuous beam shown in Figure 1. The beam has constant EI throughout. Draw the SF and BM diagrams. 14

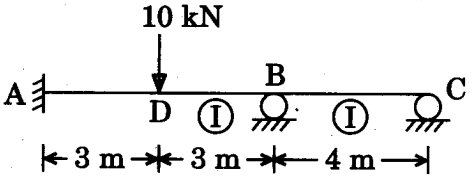

Figure 1

4. (a) Discuss possible reasons of portal frames being subjected to sway. Provide neat sketches to elaborate briefly. 7

(b) Explain the nature of internal forces developed in a three-hinged arch due to external gravity loads. 7

5. (a) Explain why lacings are provided in steel built-up columns. 7

(b) Explain the need of a column splice. Draw a neat sketch of a riveted column splice connecting I-sections. 7

6. (a) Write the advantages of steel as a construction material. 7

(b) Describe a fillet weld with a neat sketch. 7

7. Write short notes on any ***two*** of the following topics : $2 \times 7 = 14$

(a) Use of Arches in historical times

(b) Stiffness of Beam and its effect on deflection

(c) Bolted Connections