

BACHELOR OF ARCHITECTURE (BARCH)

Term-End Examination

June, 2012

00815

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 questions. Use of scientific calculator, IS 800 code and steel table is permitted.

1. Choose the most appropriate answer from the given options in questions (a) to (g) below. **7x2=14**
- (a) The structure shown in Fig.1 is :

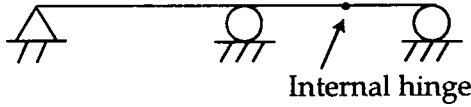


Fig. 1

- (i) determinate
 (ii) Indeterminate
 (iii) Unstable
 (iv) Unstable and determinate
- (b) Generally, indeterminate structures have members which are :
- (i) over sized (ii) slender or thin
 (iii) weak (iv) likely to fail

(c) Flexural stiffness of a beam is represented as :

- (i) $\frac{1}{EI}$ (ii) EI (iii) $\frac{EI}{\sigma}$ (iv) $\frac{\sigma}{y}$

(d) Members of a pin jointed truss

- (i) have bending moments
(ii) have shear forces
(iii) have axial forces
(iv) have all the above

(e) Indeterminacy of the rigid jointed frame shown in Fig. 2 is :

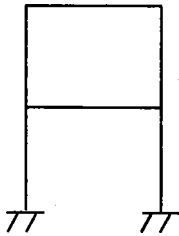


Fig. 2

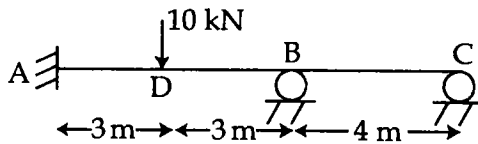
- (i) 2 (ii) 4 (iii) 6 (iv) 7

(f) Which one, among the following, is a determinate structure ?

- (i) Fixed arch
(ii) single hinge arch
(iii) two hinged arch
(iv) three hinged arch

- (g) In which case better speed of steel building construction can be maintained ?
- Riveted connections
 - bolted connections
 - welded connections
 - speed is not related to type of connection

2. (a) Write any three advantages of indeterminate structures. 6
- (b) Analyse the continuous beam, shown in Fig 3, by moment distribution method and draw BMD and SF Diagrams. 8



$EI = \text{constant}$

Fig. 3

3. (a) What do you understand by stiffness ? Describe briefly with an example. 7
- (b) Discuss how an arch acts as a curved element to bear loads on it. 7
4. (a) Discuss some advantages of steel over concrete. 7
- (b) Explain the difference between a laterally supported and laterally unsupported beam. 7

5. (a) Give an example of a prominent structure made of steel anywhere in the world and give some characteristic features of it. 7
- (b) Explain the procedure of design of a built up column of steel. 7
6. (a) Give a classification of welds used in steel construction. 7
- (b) List assumptions in the theory of riveted joints. 7
7. Write short notes on *any two* of the following : 2x7=14
- (a) Post and lintel system
- (b) Effective length of a column
- (c) Bolted connections
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