

BACHELOR OF ARCHITECTURE (B.Arch.)

Term-End Examination

December, 2014

00495

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 table is permitted.*

1. Choose the most appropriate answer from the given options in questions (a) to (g) below : $7 \times 2 = 14$
- (a) Normally, RCC framed building are
- (i) determinate structures
 - (ii) indeterminate structures
 - (iii) unstable structures
 - (iv) weak structures
- (b) Which of the following may be a unit of axial stiffness :
- (i) N/m^3
 - (ii) kN/mm
 - (iii) kNm
 - (iv) N/mm^2

- (c) Which of the following is determinate :
- Fixed arch
 - Two hinged arch
 - Three hinged arch
 - Four hinged arch

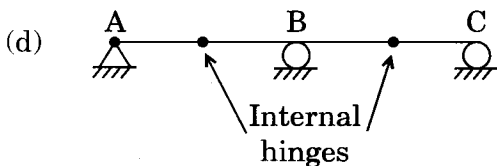


Figure 1

Beam ABC shown in Figure 1 above is

- stable
 - unstable
 - determinate
 - indeterminate
- (e) Total number of static conditions of equilibrium for a space structure is
- 3
 - 6
 - 9
 - 5
- (f) Welded connections
- improve speed of construction.
 - are quite strong.
 - provide a good appearance.
 - are such that all the above statements are true.

(g) Relationship between stress and strain is given by

- (i) Saint-Venant principle
- (ii) Hooke's law
- (iii) Bernoulli's theorem
- (iv) Newton's law

2. Analyse the beam shown in Figure 2 below by Moment distribution method and draw the bending moment diagram. 14

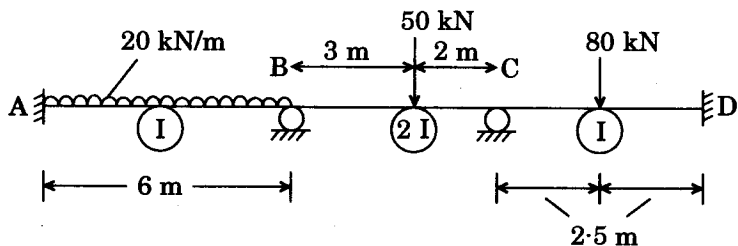


Figure 2

3. (a) Draw sketches of any two structures which are determinate. 7
- (b) Compare the working of an arch with that of a beam. 7
4. (a) Discuss your appreciation of steel as a construction material briefly. 7
- (b) Write assumptions taken for design of riveted joints in steel construction. 7

5. (a) Write various steps in the design of steel beams. 7
- (b) What are the different types of welds used in steel construction ? Describe. 7
6. (a) Discuss why arches were used on a large scale in the past. 7
- (b) Describe some advantages and disadvantages of indeterminate structures. 7
7. Write short notes on any *two* of the following topics : $2 \times 7 = 14$
- (a) Arch as a curved member
- (b) Portal frames under horizontal forces
- (c) Efficiency of an arch
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