

**BACHELOR OF ARCHITECTURE (B.Arch.)**

**Term-End Examination**

**June, 2019**

00621

**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 options given in questions (a) to (g) below :  $7 \times 2 = 14$
- (a) Compared to high yield strength steel, ductility of mild steel is
- (i) less
  - (ii) more
  - (iii) equal
  - (iv) one half
- (b) Possible number of reactions in a space frame at a fixed support is
- (i) 4
  - (ii) 2
  - (iii) 1
  - (iv) 6

- (c) Flexural rigidity of a beam is given as
- (i)  $EI^2$
  - (ii)  $EI$
  - (iii)  $E / I$
  - (iv)  $\frac{EI}{2}$
- (d) At an internal hinge in a beam the number of additional equation of equilibrium obtained is
- (i) 1
  - (ii) 2
  - (iii) 3
  - (iv) 4
- (e) A three-hinged arch has static indeterminacy equal to
- (i) 1
  - (ii) 2
  - (iii) 3
  - (iv) Zero
- (f) A beam having rollers at both of its ends and subjected to vertical and horizontal forces
- (i) is unstable
  - (ii) is stable
  - (iii) is determinate
  - (iv) is a costly structure

(g) Which of the following is generally subjected to axial forces ?

- (i) Beam
- (ii) Column
- (iii) Slab
- (iv) All of the above

2. (a) Write some advantages of indeterminate structures. 7

(b) Determine static indeterminacy of the structures shown in Figure 1. 7

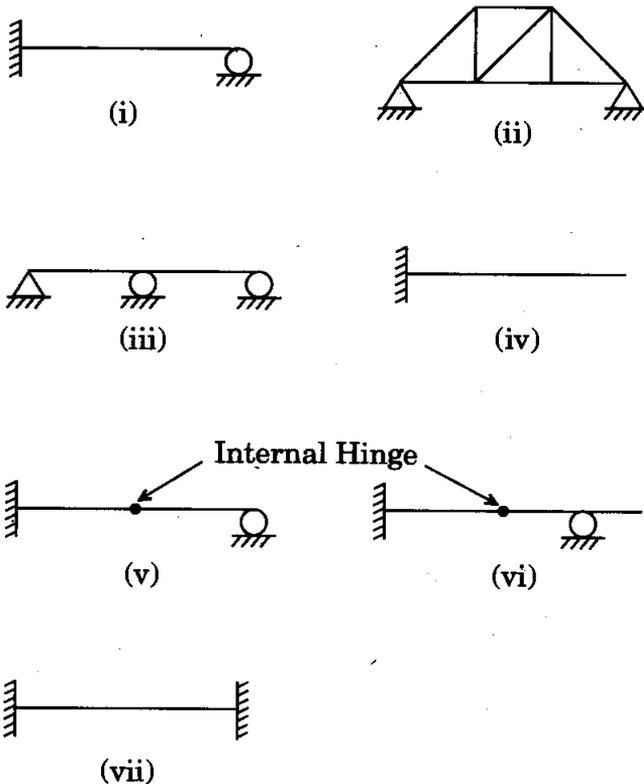


Figure 1

3. (a) What do you understand by 'stiffness' ?  
Explain with an example. 7
- (b) What do you understand by a rigid frame ?  
Explain briefly. 7
4. (a) Describe the nature of forces developed in a  
pin jointed truss. 7
- (b) Compare the working of an arch and a  
beam. 7
5. (a) Explain the nature of forces which act on a  
post and lintel system with a neat sketch. 7
- (b) Compare a three-hinged arch with a  
two-hinged arch. 7
6. (a) Discuss the advantages of welding in steel  
structures briefly. 7
- (b) Explain the construction of steel columns  
with lacing flats with a neat sketch. 7
7. Write short notes on any *two* of the following  
topics : 2×7=14
- (a) Bolted connections in steel construction
- (b) Distribution factors
- (c) Various types of steel sections
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