

No. of Printed Pages : 4

BAR-024

BACHELOR OF ARCHITECTURE

Term-End Examination

June, 2010

00925

BAR-024 : THEORY OF STRUCTURE - III

Time : 3 hours

Maximum Marks : 70

Note : Question No.1 is compulsory. Attempt any four questions from the remaining questions.

1. Choose the most appropriate option in each of the questions (a) to (g) below : **7x2=14**
- (a) Total number of reactions at a hinged support in a plane structure is :
- (i) 1
 - (ii) 2
 - (iii) 3
 - (iv) 4
- (b) In pin jointed truss :
- (i) loads are applied at the joints
 - (ii) loads are directly applied on the members
 - (iii) members are subjected to shear force and bending moments
 - (iv) members are subjected to bending moments only

BAR-024

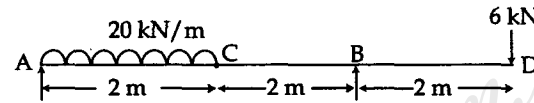
1

P.T.O.

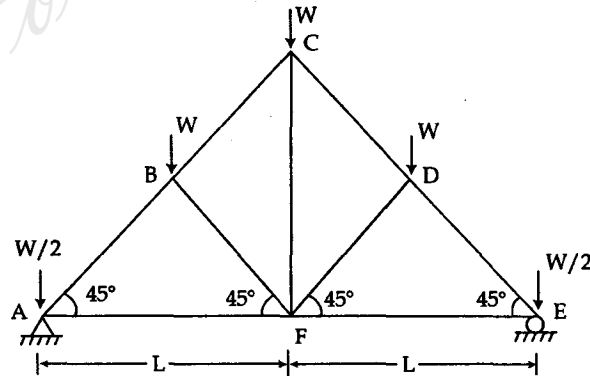
- (c) In pure bending of beams :
- (i) cross sections of beam are subjected to warping
 - (ii) shear force is maximum near the mid section
 - (iii) only bending moments are applied
 - (iv) effect of shear forces should be considered
- (d) Columns are supposed to primarily bear :
- (i) shear forces
 - (ii) bending moments
 - (iii) shear forces and bending moments both
 - (iv) axial forces
- (e) Buckling load of a column is :
- (i) proportional to its length
 - (ii) proportional to square of its length
 - (iii) inversely proportional to its length
 - (iv) inversely proportional to square of its length
- (f) In analysing a plane truss by method of joints, a joint should be chosen where the number of unknown forces is not more than :
- (i) 1
 - (ii) 2
 - (iii) 3
 - (iv) 4

- (g) If the total number of reaction components are less than the total number of condition equations of equilibrium, the structure shall be :
- (i) stable
 - (ii) indeterminate
 - (iii) externally determinate
 - (iv) unstable

2. (a) Draw the SFD and BMD for the beam 7
shown below.



- (b) Derive the basic equation for pure bending of beams. 7
3. (a) Discuss how pin jointed and rigid jointed trusses are different? 7
- (b) Determine the forces in various members of the truss shown below. 7



4. (a) Determine the deflection of free end of a cantilever which is subjected to a load 'W' at its free end. The span of the beam is 'L' and the flexural rigidity is E1. 7
- (b) Differentiate between average and maximum shear stress for a beam taking the example of a beam of an 'I' section. 7
5. (a) What are advantages of using composite sections ? Discuss briefly. 7
- (b) What do you understand by a long column ? How is it different from a short column ? 7
6. (a) What are the assumptions made in the theory of composite sections ? 7
- (b) What is the effect of end conditions on the load carrying capacity of a long column ? Discuss in detail. 7
7. (a) Write short notes on *any four* of the following : $4 \times 3\frac{1}{2} = 14$
- (i) Graphical method of analysis of trusses.
 - (ii) Buckling of columns
 - (iii) Suitability of trusses in industrial structures
 - (iv) Deflection and its importance
 - (v) Shear stress distribution over I - section