BACHELOR OF ARCHITECTURE

Term-End Examination

June, 2010

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

(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
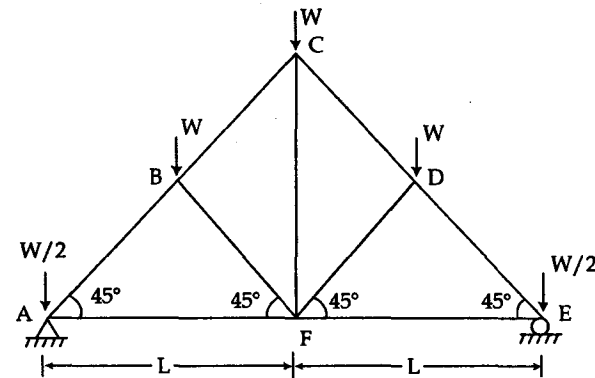
(iv) unstable

2. (a) Draw the SFD and BMD for the beam shown below.   7
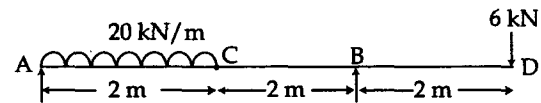
(b) Derive the basic equation for pure bending of beams.   7

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 :   4x3½=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

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