

B. ARCH
(SEM II) THEORY EXAMINATION 2017-18
Architectural Structure-II

Time: 3 Hours

Total Marks: 70

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

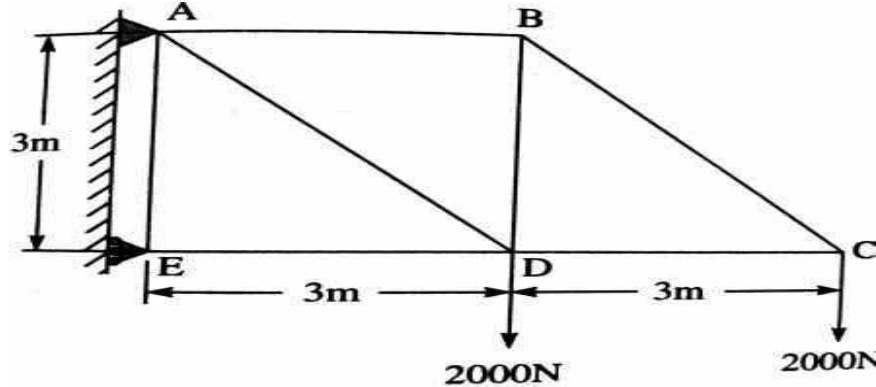
1. Attempt *all* questions in brief. 2 x 7 = 14

- a. Define Perfect Frame.
- b. How many members are cut in Method of Section for Truss?
- c. Write any two assumptions on made in theory of Torsion.
- d. What do you understand by Plane Cement Concrete?
- e. What are the boundary conditions of simply supported beam?
- f. Write the methods for finding the deflection.
- g. Define Axially Loaded Columns.

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

- a. Determine the forces in the members of the truss shown in fig.

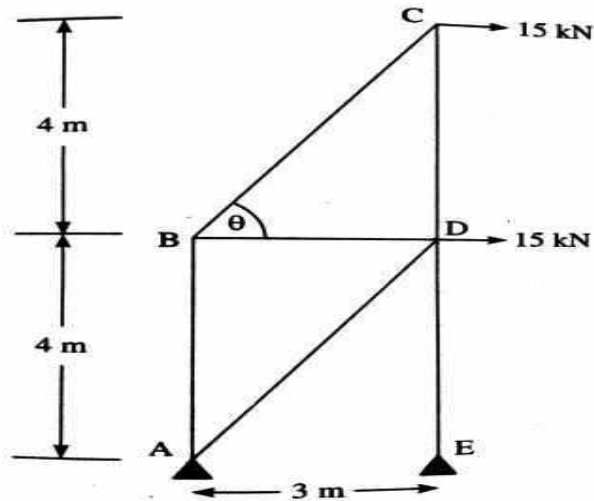


- b. What assumptions made in Theory of Torsion?
- c. What do you understand by properties of Concrete? Explain any one of them
- d. What do you understand by curvature of the bending in beam? And also find the slope
- e. What is the Limitations of Euler's Formula?

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

- (a) What conditions are satisfied for analysis of trusses? Explain in brief
- (b) Find the forces in members of the truss shown in figure



4. Attempt any *one* part of the following:

7 x 1 = 7

- (a) Define following terms (i) Polar Sectional Modulus (ii) Torsional Rigidity
- (b) A shaft consisting of a steel tube of 50 mm outside diameter is to transmit 100 KW at a frequency of 20 HZ. Determine the tube thickness which should be used if the shearing stress is not to exceed 60 MPa.

5. Attempt any *one* part of the following:

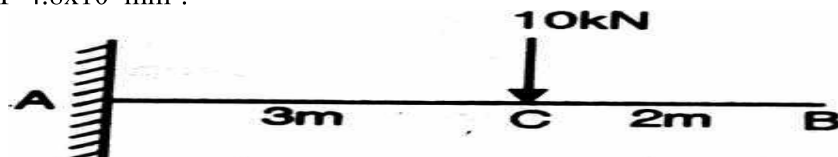
7 x 1 = 7

- (a) What do you understand by Design Mix Concrete?
- (b) Define following terms (i) Tensile strength (ii) Modulus of elasticity of Steel

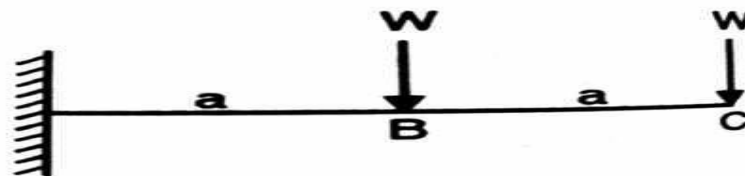
6. Attempt any *one* part of the following:

7 x 1 = 7

- (a) Determine the Slope and Deflection at point C and B take $E=2 \times 10^5$ MPa, $I=4.8 \times 10^7$ mm⁴.



- (b) A cantilever of length 2a is carrying a load W at free end and a load W at its centre. Determine Slope and Deflection at free end shown in fig.



7. Attempt any *one* part of the following:

7 x 1 = 7

- (a) Define following term for column (i) Eccentric Loading (ii) Middle third rule for Rectangular Column
- (b) Calculate the safe compressive load on a Hollow Cast iron column of 200 mm external diameter and 130 mm internal diameter. The column is 8 m long and its one end is fixed and other hinged, F.O.S.=4, $E=105$ GPa Use Euler's Equation.