C-16/C-16S-C-402

5615

BOARD DIPLOMA EXAMINATION, (C-16/C-16S)

MARCH / APRIL - 2019

DCE - IV SEMESTER EXAMINATION

THEORY OF STRUCTURES

Time : 3 Hours] [Total Marks : 80

PART - A

3×10=30

Instructions : *(1) Answer **ALL** questions.*
(2) Each question carries THREE marks.
(3) Answer should be brief and straight to the point.

1 (a) Define : Dam.
(b) List the forces acting on a dam section.

2 Define :
(a) Middle third Rule
(b) Angle of repose

3 List the conditions to check the stability of a dam.

4 Define :
(a) Active Earth Pressure
(b) Passive Earth Pressure.

5 A cantilever of span 6 m carries a point load of 15 kN at 2 m from fixed end. If the beam is propped at free end, determine the magnitude of the prop reaction.

6 List any three Merits and Demerits of fixed beams over simply supported beams.

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7 A fixed beam of span 4 m carries a u.d.l. of 25 kN/m over the entire length. Draw S.F and B.M diagram and indicate the values.

8 Define : (a) frame. (b) State the difference between Perfect and Imperfect frames.

9 List the methods used for analyzing statically determinate frames.

10 List the contitions in which method of sections is preferred to find the forces in a frame.

PART - B

10×5=50

Instructions : *(1) Answer any **FIVE** questions.*
*(2) Each question carries **TEN** marks.*
(3) Answer should be comprehensive and criterion for valuation is the content but not the length of the answer.

11 A masonry dam 8m high 1.5 m wide at top and 5 m wide at bottom retains water up to a depth of 7.5 m. The water face of the dam is vertical. Find the maximum and minimum stresses at base. Specific weight of masonry 22.4 kN/m^3 and that of water is 10 kN/m^3.

12 A masonry trapezoidal dam 5m high, lm wide at its top and 3m wide at its bottom retains water on its vertical face. What are the maximum and minimum stresses at the base when the reservoir is full and when the reservoir is empty. Take the specific weight Of masonry = 22kN/m^3 and specific weight of water = 10 kN/m^3.

13 A trapezoidal masonry retaining wall 2 m top width, 8 m bottom width is 10m high and has a batter of 1 H to 5 V on the earth face. Check the stability of wall, if earth is upto top level of wall. Specific weight of masonry = 20kN/m^3. Coefficient of friction = 0.6 and allowable compressive stress = 400 kN/m^2. specific weight of earth is 16 kN/m^3. $\phi = 30°$

14 A horizontal cantilever 6m long carries a u.d.l. of 5 kN/m over a length of 2 m from fixed end. If the beam is propped at the free end to the level of the fixed end, find the load on the prop and construct S.F and B.M diagrams. Given E = 10 kN/mm^2 and I = 115.2 × 10^6 m^4.

15 A continuous beam ABC 9 m long is continuous over two spans AB = 4 m and BC = 5 m. The supports are at the same level. The ends A, B and C are simply supported. AB is loaded with u.d.l. of 2.5 kN/m and BC with a concentrated load of 5 kN at 3m from C. Find the support moments and reactions at supports. Sketch the S.F and B.M diagrams.

16 A beam of length 6 m is fixed at both ends and carries a point load of 30 kN at its centre. Determine fixed moments at support and draw SFD and BMD. Find maximum deflection at the centre from basic principles, by Moment - Area method. Take EI = 50 × 10^9 kN/mm^2.

17 A beam ABC, 12 m long and of uniform cross section is fixed at both the ends A and C and freely supported at B, 8m from A. Span AB carries a u.d.l. of 10 kN/m and BC carries a point load of 50 kN at its mid span. Using the method of moment distribution, determine the support moments and draw the B.M. diagram

18 Find the forces in the members of the truss by the method of joints of span 5 m and is carrying a load of 10 kN at its apex with an angle of 60° at A and 30° at C as shown in the figure.