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C09-C–303

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BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL—2021

DCE - THIRD SEMESTER EXAMINATION

STRENGTH OF MATERIALS AND THEORY OF STRUCTURES

Time : 3 hours] [*Total Marks* : 80

PART—A 4×5=20

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **four** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Write the equation for section modulus for *(a)* recangular and *(b)* circular sections.

2. State the general equation for shear stress distribution of a beam.

3. Write the equation for maximum deflection of a beam of length *L* when it is bent into an arc of radius *R*.

4. State the differential equation of flexure.

5. Draw the elastic curve for *(a)* cantilever and *(b)* simply supported beam.

6. Define *(a)* critical load and *(b)* factor of safety.

7. State the classification of columns.

8. What is a retaining wall?

9. Mention the classification of frames.

10. Write any two assumptions in calculating shear stress due to torsion.

PART—B

15×4=60

Instructions : (1) Answer *any* **four** questions.

(2) Each question carries **fifteen** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. Write briefly about the role of a civil engineer in maintaining a building after construction.

12. State the assumptions made in the theory of simple bending.

13. Differentiate between double integration method and Macaulay's method in calculating slope and deflection of a beam.

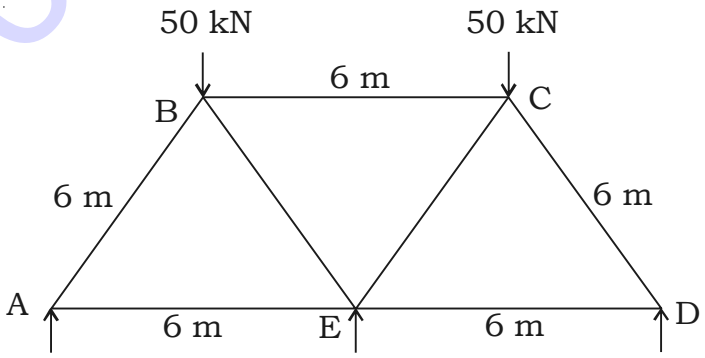
14. State the Mohr's theorem-I and Mohr's theorem-II.

15. A column is 5 m long and fixed at both ends. It is circular in section with a diameter of 200 mm. calculate the Euler's crippling load. $E = 2 \times 10^5$ N/mm^2.

16. An R.S.J. is used as a column of length 6 m with both ends hinged. Determine safe axial load on the column using Euler's equation. Given factor of safety (F.S.) = 3, $I_{min} = 150 \times 104$ mm^4 and $E = 2{\cdot}1 \times 10^5$ N/mm^2.

17. A trapezoidal dam 6 m high, 2 m wide at top 4 m wide at bottom retains water to a height of 5 m. calculate the pressure due to water acting on the dam (P) and weight of the dam (W). given density of water = 10 kN/mm^3 and density of dam material = 24 kN/mm^3.

18. Calculate member forces for the members AB, AE, BE and BC for the truss shown in the figure below.



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