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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) rectangular 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.

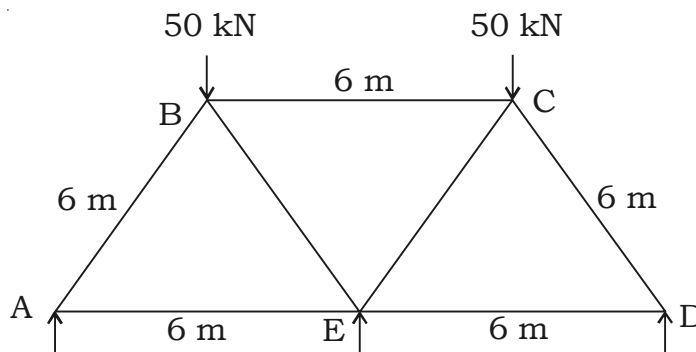
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PART—B

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. $E = 2 \times 10^5 \text{ N/mm}^2$.
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, $I_{\min} = 150 \times 10^4 \text{ mm}^4$ and $E = 2.1 \times 10^5 \text{ N/mm}^2$.
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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