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C14-C–302

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BOARD DIPLOMA EXAMINATION, (C-14)

MARCH/APRIL—2021

DCE - THIRD SEMESTER EXAMINATION

MECHANICS OF SOLIDS

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. Define *(a)* Continuous beam and *(b)* Overhanging beam.

2. Calculate the reaction for S. S. B. of 6 m span subjected to udl of 25 kN/m over the entire span.

3. Define point of contra flexure.

4. Define *(a)* Neutral layer and *(b)* Neutral axis.

5. List any two assumptions in the theory of simple bending.

6. Define flexural rigidity.

7. Draw the deflected shape of any two types of beams.

8. Write the differential equation of bending.

9. State the equations for max slope and max deflection for a simply supported beam of span 'I' subjected to point load at the center.

10. Calculate max deflection for a cantilever of span 2 m subjected to a point load of 20 KN at the free end.

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. Being a Civil Engineer, briefly explain how you are going to serve the nation.

12. Sketch the SFD and BMD for a simply supported beam of span 5 m with a central point load of 100 KN, and indicate S. F. and B. M. values.

13. Calculate the section modulus (z) for :

(a) square of 80 mm side

(b) rectangle of 200 mm wide and 450 mm deep

(c) circle of 150 mm

14. A timber joist of rectangular cross-section 120 mm wide and 250 mm deep is simply supported over a span of 3 m and carries a udl of 15 KN/m over the entire span. Calculate the max stress developed in the timber joist.

15. Calculate the max slope and max deflection for a cantilever beam of span 2·5 m, subjected to a udl of 20 KN/m over the entire span.

16. Calculate max slope and max deflection for a simply supported beam of span 8 m subjected to a point load of 40 KN at the middle of span by moment area method.

17. Calculate the longitudinal and hoop stress in a thin cylinder of 500 mm diameter and 20 mm thickness when it is subjected to an internal pressure of 2 N/mm^2.

18. State the formula for power transmitted by a solid circular shaft and name the terms.

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