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C14-C–105

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BOARD DIPLOMA EXAMINATION, (C-14)

MARCH/APRIL—2021

DCE - FIRST YEAR EXAMINATION

ENGINEERING MECHANICS

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 the terms *(a)* Statics and *(b)* Dynamics.

2. Define moment of a force.

3. Define a couple.

4. State which is the centroid of the parallelogram *(a)* any corner of the parallelogram or *(b)* intersection of the diagonals.

5. Locate the centroid of a square with a neat sketch.

6. Write the equation for moment of inertia of a circular section of diameter 'D'.

7. Define radius of gyration.

8. Define stress.

9. Write any two types of stresses.

10. Define Hooke's law.

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. What is the role of a civil engineer in construction field?

12. State the parallelogram law of forces with a neat sketch.

13. Sketch and locate the centoid of the following *(a)* Rectangle, *(b)* Right angled-triangle and *(c)* Circle.

14. Calculate the Moment of Inertia of rectangular section of width 60 mm and depth 120 mm.

15. Calculate the radius of gyration of a circular section of 150 mm diameter.

16. Calculate the Young's modulus of a material, which is subjected to a stress of 500 N/mm^2 and a strain of 5×10^{-3} in the direction of stress.

17. Define modulus of rigidity and calculate the same if shear stress is 15 N/mm^2 and shear strain is 5×10^{-6}.

18. Distinguish between different kinds of stresses.

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