6223

BOARD DIPLOMA EXAMINATION
MARCH/APRIL - 2019
DIPLOMA IN CIVIL ENGINEERING
STRENGTH OF MATERIALS & THEORY OF STRUCTURES
THIRD SEMESTER EXAMINATION

Time: 3 Hours **Total Marks: 80**

PART - A (3m x 10 = 30m)

Note 1:Answer all questions and each question carries 3 marks

2:Answers should be brief and straight to the point and shall not exceed 5 simple sentences

1. Find the modulus of section of square beam of size 300mm X 300mm.
2. Define (i) Flexural Rigidity and (ii) Modulus of Section
3. List the different methods to find slope and deflection at appoint in a loaded beam.
4. States the Mohr's theorm I and Mohr's theorm -II
5. Write any three applications of Principal Stress.
6. Write any three assumptions made in deriving the torsion Formula
7. Write the formulas for (i) Circumferential strain and (ii) Longitudinal strain.
8. Write any two differences between short column and long column
9. Write any three conditions for the stability of a dam
10. Write any three differences between statically determinate and inderminate structures

PART - B (10m x 5 = 50m)

Note 1:Answer any five questions and each question carries 10 marks

2:The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer

11. A test specimen 25 mm square in section is broken by a load of 800N applied at middle of a span one meter. Use factor of safety of 6. Calculate the safe UDL in Newton for beam of same material 120mm wide and 300mm deep freely supported over a span of 5 m.

12. A 300 mm deep. 150mm wide rolled steel joist of I-Section with flanges 15mm thick, web 10mm thick is used as simply supported beam of span 4m. Find the UDL the beam can carry without exceeding the shear stress of 40N/mm2.

13. **A simply supported beam of span 4m carries a UDL of 20KN/m including its self weight. The width of the wooden rectangular beam is 300mm. The permissible bending stress is not to exceed 5N/mm^2 and the central deflection is not to exceed to 6mm. Determine the depth of the beam required. Take E=1.25X10^4 N/mm^2.**

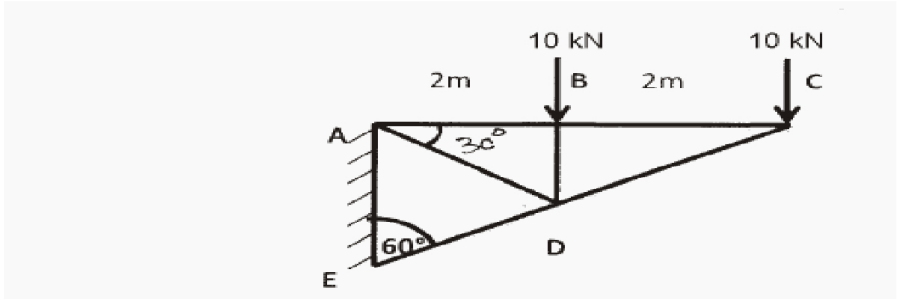
14. **A simply supported beam of span 4m carries a point load of 30KN at its mid span. Find the maximum slope and deflection by moment area method. Take EI=4000KNm^2.**

15. **A hollow cast iron column with hinged ends, supports an axial load of 1000KN. If the column is 6m long and has an external diameter of 300mm, find the thickness of metal required. Use Rankine's formula taking constants α =1/1600 and working stress of 80N/mm^2.**

16. A column 1 m long has an area of cross section of 900 mm2. Find the slenderness ratio if the section is a) Circular b) Square c) Rectangular with depth twice the width. State which of the column is strongest.

17. **Find the necessary width and depth for the foundation of a square column supporting an axial load of 5000KN. Assuming the safe bearing capacity of soil is 210KN/m^2. The angle of repose of the soil is 30 degrees and weight of the soil is 20KN/m^3. Use Rankine's formula.**

18. **Find the forces in the members of the truss as shown in the figure by method of joints**



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