6223
BOARD DIPLOMA EXAMINATION
JUNE - 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. .Define (i) Neutral axis and (ii) Curvature of the beam.

2. Find the modulus of section of square beam of size 300mm X 300mm.

3. Draw the deflected shape of cantilever and simply supported beam.

4. States the Mohr's theorem I and Mohr's theorem II.

5. Define (i) Major Principal Plane and (ii) Minor Principal Plane.

6. Find the Torques which a shaft of 300mm diameter can safely transmit, if the shear stress is not to exceed 48N/mm^2.

7. A cylindrical shell of 2m diameter and 20mm thick is subjected to an internal pressure of 3N/mm^2.Find the longitudinal stresses developed in the material of the cylinder.

8. Define (i) Column, (ii) Post and (iii) Stanchion

9. what are the forces acting on the gravity dam.

10. Write short note on (i) Perfect frame and (ii) Imperfect frame

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 simply supported beam of span 8m carries a UDL of 16KN/m and a point load of60 KN is   acting at center. Calculate the maximum shear stress under the following cases.

> i) If the rectangular beam of size 200mmX400mm is used.
> ii) If circular beam of diameter 280mm is used.
> iii) If the squares beam of size 320mm is used.

12. 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.

13. A simply supported beam of span 6m carries a point load of 10KN placed at a distance of 2m from RHS. Determine the slope at the ends and maximum deflection. Use Macaulay's method. Take $E=200KN/mm^2$ and $I=48X10^6 mm^4$.

14. A cantilever beam of span AB which is fixed at A and propped at the end B carries a UDL of w KN/m over its entire span. Calculate the moments at A and reaction at the support. Draw SF and BMD.

15. A column 1 m long has an area of cross section of 900 mm2. Find the slenderness ratio if the section is a)

    width. State which of the column is strongest.

16. In a compression test for a 16mm diameter pin ended strut, the following results are obtained

    Length   **Crippling load**

300mm	35KN
500mm	20KN

    Determine from these observations, the two constants in the Rankin's formula.

17. A masonry retaining wall of trapezoidal cross section has a top width of 1m and bottom width of 4m is retaining earth to its full height of 9m. The weight of masonry is 30KN/m³ and that of soil is 15KN/m³. The angle of repose of soil is 30 degrees. Check the stability of the retaining wall against overturning, sliding and factor of safety. The friction coefficient is 0.6.

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

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