



C-14-C-402

4420

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH / APRIL - 2019

DCE - IV SEMESTER EXAMINATION

THEORY OF STRUCTURES

Time : 3 Hours]

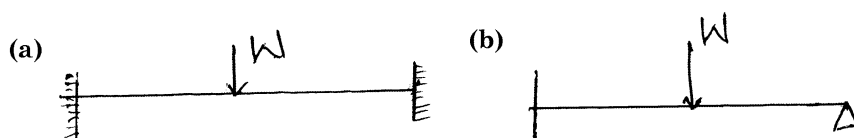
[Total Marks : 80

PART - A

3×10=30

- Instructions :**
- (1) Answer **ALL** questions.
 - (2) Each question carries **THREE** marks.
 - (3) Answer should be brief and straight to the point and shall not exceed five simple sentences.

- 1 Define (a) Buckling (b) Least radius of gyration.
- 2 What is middle third rule in case of Dams/retaining walls ?
- 3 List out the conditions for the stability of dams.
- 4 Write the equations of active earth pressure and passive earth pressure and name the terms
- 5 State the formula for the minimum depth of foundation according to Rankines theory and name the terms
- 6 List out the merits and demerits of Fixed beams
- 7 Write down the Clapeyrons theorem of three moments and name the terms.
- 8 Calculate the degree of static indeterminacy for the beams shown subjected to vertical loading.

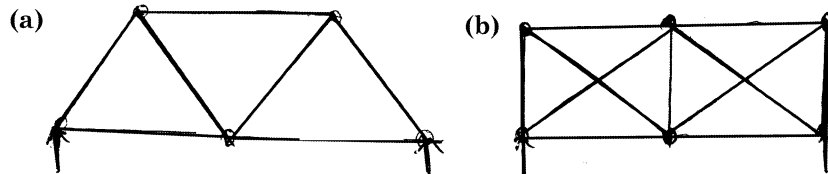


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9 Classify the shown frame as per the number of joints and members.



10 Define Strat Member & Tie member Draw singn convention for each.

PART - B

10×5=50

- Instructions :**
- (1) Answer any **FIVE** questions.
 - (2) Each question carries **TEN** marks.
 - (3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.
 - (4) Assume suitable data wherever necessary

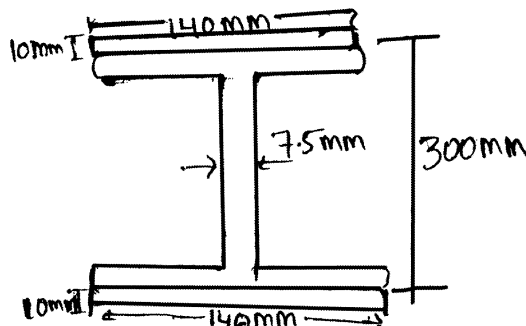
- 11 (a) Distinguish between long & short columns. 3
 (b) Design a hallow mild steel circular column by Eulers theory 7
 with the following data compressive load of 100KN. Youngs modulus is 200 Gpa, Length of the column is 5m, hinged at one end and fixed at the other end , ratio of external diameter to the Internal diameter $D/d=1.5$

12 Determine the Compressive strength values by Rankine theory with the following data :

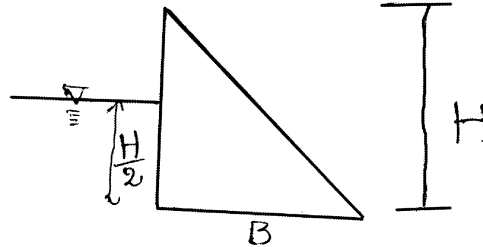
$A = 5626 \text{ mm}^2, F_c = 550 \text{ N/mm}^2, I_{xx} = 8603.6 \text{ cm}^4$

I Section $\alpha = 1/1600, I_{yy} = 453.9 \text{ cm}^4$

L = 6 meters with both ends fixed

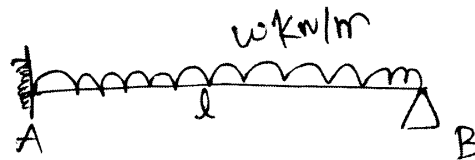


- 13 Derive the minimum base width for economical Triangular section with a free board as shown to avoid tension at the base.



- 14 A retaining wall of trapezoidal section with 10 metre high and 2 metre at top and 5 metre wide at bottom with a vertical back and retaining earth level to its top. Specific weight of masonry is 20KN/m^3 , and that of the earth is 18KN/m^3 . Angle of repose of earth is 40° . Check the stability of the wall if the allowable S.B.C. is 300KN/sqm . Coefficient of friction between soil and masanory is 0.8

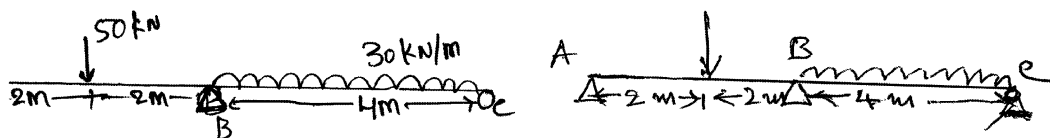
- 15 (a) Determine the Magnitude of Prop reaction and Bending moment at the fixed end for the propped cantilever as shown. 5



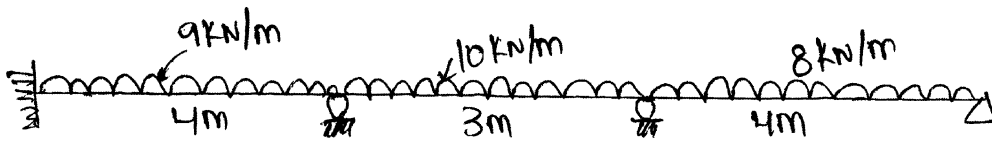
- (b) Derive the formulae for the fixed end moments due to UDL by moment area methods. 5



- 16 Analyze the continuous beam as shown by three moment theorem. Draw Bending moment diagram with the indication of salient points.



- 17 Analyze the continuous beam as shown of same cross section and same material as shown by Moment distribution method and draw the Bending moment diagram.



- 18 Determine the member forces DE, BC & BD of truss as shown by method of sections.

