C14-C-**402**

4425

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH /APRIL-2019

DCE - FOURTH SEMESTER EXAMINATION

THEORY OF STRUCTURES

Time: 3 Hours Max. Marks : 80

PART -A

10x30=30M

Instructions: 1) Answer **all** the questions. Each question carries **three** marks.
2) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1) Define

(a) Buckling Load (b) Safe Load (c) Effective Length.

2) List the forces acting on a dam.

3) Write any two differences between Active earth pressure and passive earth pressure.

4) Write any three assumptions made in the Rankine's theory of Active earth pressure.

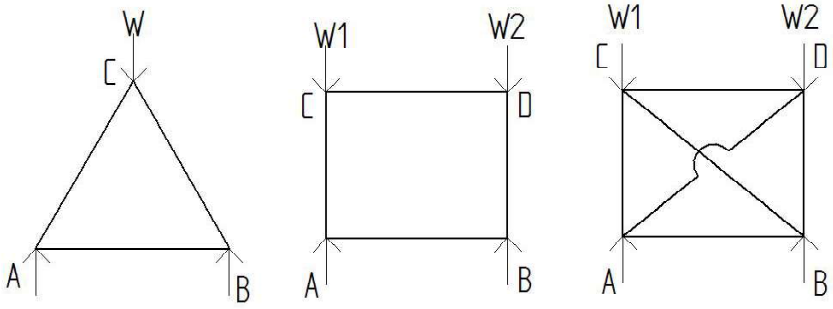
5) State the Rankine's formula for minimum depth of foundation and expand the terms.

6) Calculate Degree of Static Indeterminacy for
(i) Propped Cantilever (ii) Fixed beam.

7) Write the advantages and disadvantages of fixed beams.

8) Write a short notes on (i) Stiffness factor (ii) Distribution factor.

9) Classify the following structures whether they are perfect frame or Imperfect frame based on number members and joints.



10) State any three assumptions made in the analysis of frames.

PART-B

5 x 10= 50M

Instructions: 1) Answer any five questions. Each question carries Ten marks.
2) Answers should be compreshensive and the criteria for valuation is the content but not the length of the answer.

11) Determine the ratios of the buckling strengths of two circular colums, One hollow and the other solid. Both the columns are made of the same material and have the same length, same cross sectional area and same end conditions. The internal dia. of the hollow column is half that of its external diameter.

12) A steel stanchion is built up of two 225 x 100mm standard channels placed 120mm apart back to back with plates 320 x 12mm connected one to each flange. The stanchion is 8m long and has both ends fixed. Calculate the critical load using both Euler's and Rankine's formulae.

Properties of each channel I_{xx} = 3688x10^4 mm^4,I_{yy}=298.4x$10^4$$mm^4$, A= 3565$mm^2$, C_{yy}=27mm, f_c=315N/mm^2, a=1/7500and E=2x10^5N/mm^2.

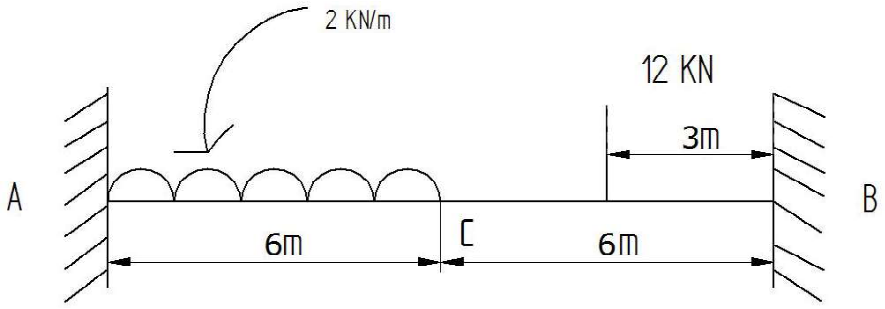
13) A masonry dam of trapezoidal section is 10m high and retains water upto the top. The width at the top is 3 meters and at the bottom 8 meters. The water face has a batter of 1 in 10. Find the maximum amd minimum intensities of stresses at the base. Take Masonry unit weight as 24kN/cu.m and water unit weight as 10kN/cu.m.

14) Design a suitable section of trapezoidal masonry retaining wall 12m high to retain earth on its vertical back weighing 16kN/cu.m so that no tension is formed at the base. Angle of repose of earth is 30^0 and earth surface is horizontal and is in level with the top of wall. Take weight of masonry as 24kN/cu.m. Take top width = 1/4 height of wall.

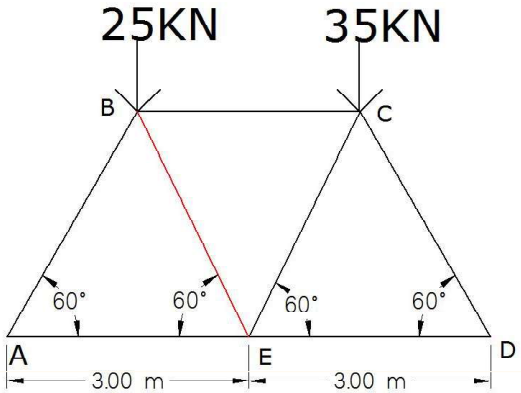
15) A cantilever beam of span 4 which is fixed at 'A' and propped at the end 'B' carries a udl of 5kN/m over its entire span. Calculate the reaction of the prop. Draw the shear force and BM diagrams. Also locate the point of contraflexure.

16) A two span continuous beam ABC is simply supported at A and C and is continuous over support B. Span AB=6m, BC=8m. The beam carries a udl of 4kN/m over both the spans. EI is constant for the both spans. Find the support moment at B and draw the BMD.

17) A continuous beam with fixed end supports is loaded as shown in figure. Determine the moments over the beam and draw the bending moment diagram using moment distribution method.



18) Find the magnitude and nature of forces in all the members of the truss shown in fig. by method of joints.



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