



Sanjay Ghodawat University, Kolhapur
Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

2018-19

EXM/P/09/01

Year and Program: 2018-19 School of Architecture

Department of FY B.Arch

Course Code: ARC106

Course Title: Theory of
Structure - II

Semester - II

Day and Date

Wednesday 22nd May 2019

End Semester Examination
(ESE)

Time: Max Marks: 80

2:30 pm to 5:30 pm

Instructions:

- 1) All questions are compulsory.
- 2) Assume suitable data wherever necessary.
- 3) Figures to the right indicate full marks.

Q.1 Solve the following

a) Explain the Following

1. Define stress and its classifications
2. Define Young's Modulus, Bulk Modulus

b) A brass bar having c/s area 1000 mm^2 , subjected to axial forces as shown in fig. 1. Find total elongation of the bar, if $E = 1.05 \times 10^5 \text{ N/mm}^2$

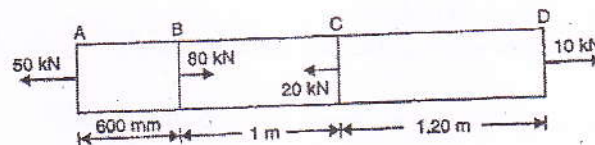


Fig.1.

OR

b) A metallic bar $300 \text{ mm} \times 100 \text{ mm} \times 40 \text{ mm}$ is subjected to a force of 5 kN (tensile), 6 kN (tensile), 4 kN (tensile) along x, y, z directions respectively shown in fig.2. Determine change in the volume of the block. Take $E = 2.0 \times 10^5 \text{ N/mm}^2$ and Poisson's ratio is 0.25.

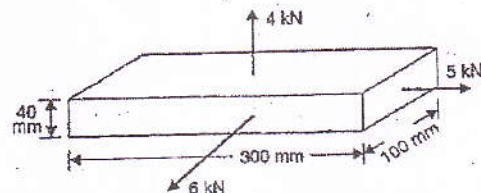


Fig.2

Q.2 a) Explain the following terms

1. Shear force diagram, Bending moment diagram
2. Point of contra shear, Point of contra flexure

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Mark s	Bloom's Level	CO
06	L ₁	CO1

10	L ₃	CO2 CO1
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10	L ₃	CO2
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06	L ₂	CO3
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- b) A simply supported beam shown in Fig.3 of length of 6m carries point load of 3 kN and 6 kN at a distance of 2m and 4m from left Support A. Draw S.F.D. and B.M.D.

10

L₃

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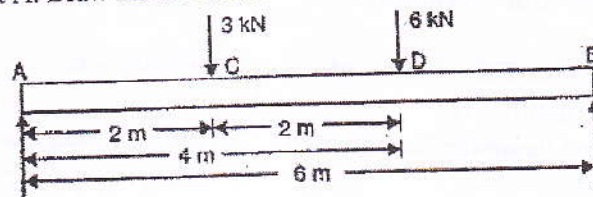


Fig.3

OR

- b) A cantilever beam of 2 m carries three point loads as shown in fig.4 Draw S.F.D. and B.M.D for a cantilever beam.

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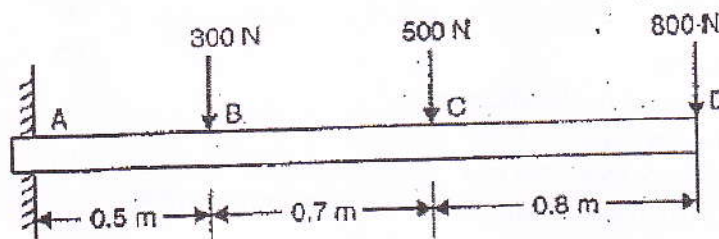


Fig.4

- Q.3 a) Explain the theory of simple bending, flexural formula, and its assumptions

06

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- b) A cast iron beam is of T- section as shown in fig 5. the beam is simply supported on a span of 8 m. The beam carries a UDL of 1.5kN/m on the entire span. Determine maximum tensile and maximum compressive stresses.

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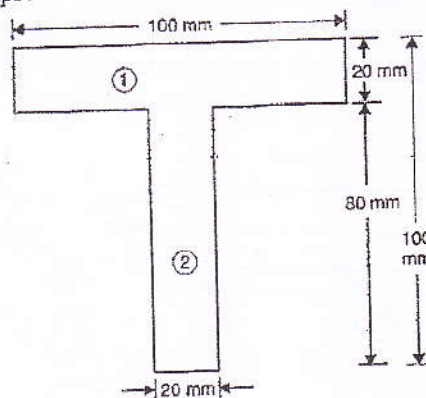


Fig.5.

- Q.4 a) Draw shear stress distribution for rectangle, circle, T-section, I-section. Mark the points Avg. shear and max. shear on diagram.

06

L₁

CO5

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- b) An I section beam $350\text{ mm} \times 150\text{ mm}$ has web thickness of 10 mm and flange thickness of 20 mm as shown in fig.6. If the shear force acting on beam is 40 kN . Find the maximum stress developed in the section. Also draw stress distribution along the section.

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L₃

CO5

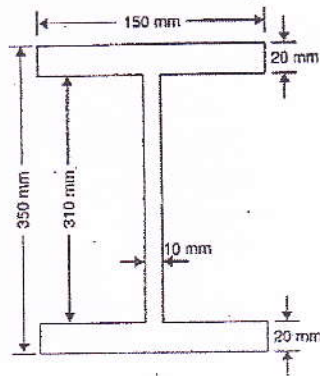


Fig.6.

- Q.5 a) Explain middle third rule kernel of section.
b) A rectangular column of width 200 mm and thickness 150 mm carries a point load of 240 kN at an eccentricity of 10 mm as shown in fig.7. Find maximum and minimum stress on the section.

06

L₂

CO6

10

L₃

CO6

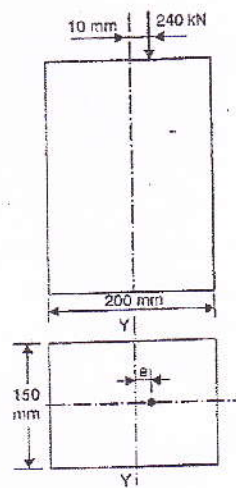


Fig.7.

OR

- b) Determine maximum and minimum stresses at the base of the hollow circular chimney and height 20 m with external diameter 4 m and internal diameter 2 m . The chimney is subjected to horizontal wind pressure of intensity 1 kN/m^2 . The specific weight of material of chimney is 22 kN/m^3 .

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L₃

CO6

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