

PARUL UNIVERSITY
FACULTY OF ARCHITECTURE
B.Arch., Winter 2017-18 Examination

Semester: 4

Subject Code: 01101256

Subject Name: Structural Design & Analysis-II

Date: 29/12/2017

Time: 02:00PM to 04:00PM

Total Marks: 50

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions whenever required.
4. Draw suitable sketches whenever required.

Q.1 Define following: (10)

1. Stress, 2. Strain, 3. Hooke's law, 4. Bulk modulus, 5. Volumetric strain, 6. Principle of superposition, 7. Poisson's ratio, 8. Modular ratio, 9. Shear force, 10. Bending moment.

Q.2 Answer the following: (Attempt any 5) (20)

1) Write difference between following: (Any 2)

1. Super structure and substructure.
2. Young's modulus and bulk modulus.
3. Longitudinal strain and direct strain.

2) Fill in the blanks

1. Modulus of elasticity is $2.0 \times 10^5 \text{ N/mm}^2$ is called _____.
2. _____ and cantilever beams are example of determinate structure.
3. _____ is unit of bulk modulus.
4. Shear stress upon shear strain is known as _____.

3) A reinforced concrete circular column of 400 mm diameter has 6 steel bars of 20 mm diameter embedded in it. Find the maximum load which the column can carry, if the cylinder carrying a load of 25kN, find the stress in cylinder. Also find the deformation of cylinder, if MOE is 100 GPa.

4) Draw shear force diagram for a cantilever beam. For fig.1

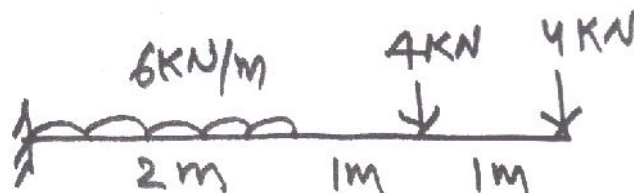


Figure No 01

5) Draw bending moment diagram for a cantilever beam. For fig 1.

6) Derive the expression of principle of superposition for composite section

Q.3 Explain briefly: (Attempt any five out of six) (10)

1. Explain the term point of contracture.
2. Draw the sketch of different type of beam, supports and loads.
3. Explain advantages and disadvantages of determinate structure.
4. Draw stress- strain curve for mild steel and explain the important point.
5. The material goes under considerable deformation with rupture is called _____.
6. Equilibrium of body

Q.4 (Attempt any two out of three)

(10)

- 1) A member ABCD is subjected to point load as shown in fig. determine the total change in length of the member take $E = 200 \text{ GPa}$. Fig 2

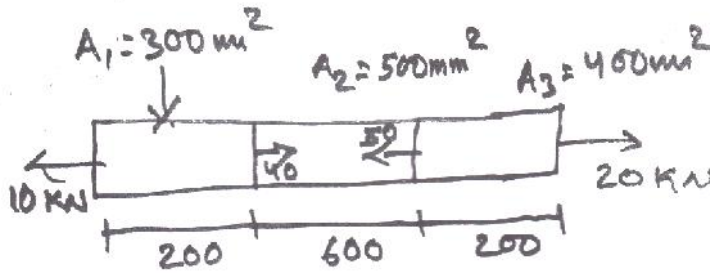


Figure No 02

- 2) Solve for shear force and draw the shear force diagram for fig 3.

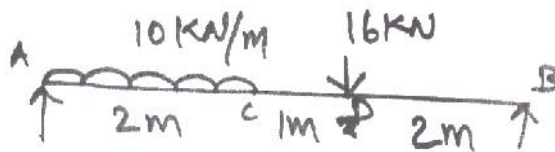


Figure No 03

- 3) Solve for bending moment and draw the bending moment diagram fig 3.