

**PARUL UNIVERSITY**  
**FACULTY OF ARCHITECTURE & PLANNING**  
**B.Arch./ B.ID Winter 2019-20 Examination**

Semester: 4

Subject Code: 01101256

Subject Name: Structural Design & Analysis - II

Date: 28-11-2019

Time: 10:00 am to 12:00 pm

Total Marks: 50

**Instructions:**

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

**Q.1** Explain the difference between substructure and superstructure (10)

**Q.2** Attempt any five out of the following six: (20)

1) Fill in the blanks:

- a) \_\_\_\_\_ is unit of bulk modulus.
- b) \_\_\_\_\_ and cantilever beams are example of determinate structure.
- c) Shear stress upon shear strain is known as \_\_\_\_\_.
- d) The material goes under considerable deformation with rupture is called \_\_\_\_\_.

- 2) Derive the expression of principle of superposition for composite section.
- 3) Draw stress-strain curve for mild steel and explain the important point.
- 4) Explain advantages and disadvantages of determinate structure.
- 5) Draw shear force diagram for a cantilever beam shown in Fig.1

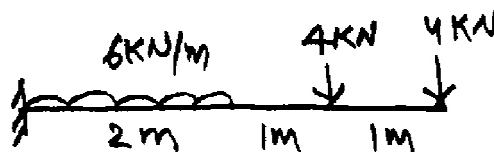


Fig 1

6) Solve bending moment and draw the bending moment diagram of the conditions shown in Fig 2

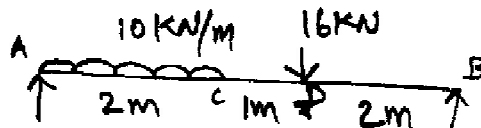


Fig 2

**Q.3** Explain the following in brief: (10)

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

**Q.4** Explain the following: (Any two) (10)

- 1) 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 stress on the steel is 120 kN and the stress of concrete is 5 kN.
- 2) Explain different types of beam, support and loads in detail.
- 3) A member ABCD is subjected to point load as shown in the below figure determinate the total change in length of the member take  $E = 200 \text{ GPa}$ .

$R_1 = 300 \text{ mm} \quad A_2 = 300 \text{ mm} \quad A_3 = 400 \text{ mm}$

