

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2013

Subject code: 712005N

Date: 06-06-2013

Subject Name: Basic Concepts of Structural Behaviour

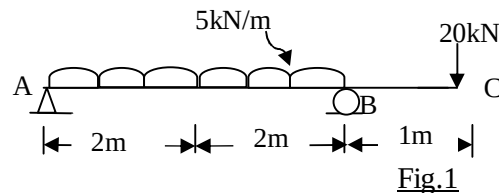
Time: 10.30 am – 01.00 pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain various types of loads which are to be considered in the analysis and design of structures. **07**
- (b) Explain steps to design a column and importance of end support conditions in the design of a column. **07**
- Q.2** (a) Determine support reactions for an overhanging beam loaded as shown in fig.1 **07**



- (b) What are the different types of structural failure and discuss the methods to prevent them. **07**
- OR**
- (b) Explain cable structures and Arches giving examples with neat sketches **07**
- Q.3** (a) Explain behavioral pattern of structural members in different types of forces such as Tension, compression, bending, and torsion. **07**
- (b) Explain stress and strain in general. What are the different types of stresses and strains. **07**
- OR**
- Q.3** (a) A simply supported beam is of length 6.0m carries a uniformly distributed load of 5kN/m over the entire length and a concentrated load of 15kN at mid span. Draw shear force and bending moment diagrams for the beam. **07**
- (b) Draw deflected shapes of the following beams: **07**
- Cantilever beam with udl over entire length
 - A beam with overhanging from both the sides with udl
 - A three span continuous beam with udl.

- Q.4 (a)** Determine the member forces in the truss shown in fig.2, using a joint equilibrium approach. **07**

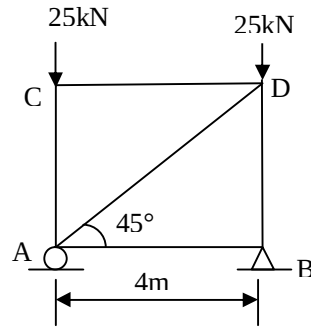


Fig.2

- (b)** Discuss Advantages and disadvantages of load bearing and framed structures. **07**

OR

- Q.4 (a)** How the modeling of structures and the external loads are done for the purpose of analysis and design. **07**
- (b)** Draw bending stress and shear stress distribution in the beam of cross-section: T-shape, H-shape and I-shape. **07**

- Q.5 (a)** Write short note on Plates and grids. **07**
- (b)** Draw Stress ÷ strain graph for mild steel bar under the axial tensile force showing all important points and explain the behavior. **07**

OR

- Q.5 (a)** Classify structures in general with neat sketches. **07**
- (b)** Explain importance of forces, moments, equilibrium and free-body diagrams in analysis and design of structures. **07**
