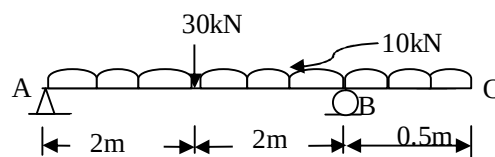


GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014****Subject code: 712005****Date: 21-06-2014****Subject Name: Basic Concepts of Structural Behaviour****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

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

Q.1 (a) Give Classification of structures in general. **07**

(b) Determine the unknown reaction forces R_A & R_B for the beam loaded as shown in fig.1 **07**

Fig.1

Q.2 (a) Explain behavioural pattern of structural members in Tension, compression, bending, and torsion with neat sketches. **07**

(b) Explain various types of loads that are considered in Analysis and design of structures in general. **07**

OR

(b) What is the importance of end (support) conditions in design of a column? Give design steps for design of a column. **07**

Q.3 (a) What is 'Shear Center'? Explain the importance of the Shear Center in behaviour of a member. **07**

(b) Draw shapes of Shear force and bending moment diagrams for the following two beams: **07**

Simply supported beam with a concentrated load at mid-span.
Cantilever with udl over entire length.

OR

Q.3 (a) Determine maximum bending stress for a simply supported beam of length 4m carrying a concentrated load of 100kN at its mid span. The cross-section of the beam is rectangular ($B=300\text{mm}$, $D=450\text{mm}$). **07**

(b) What is stress and strain? What are the different types of stresses and strains in general. **07**

Q.4 (a) Draw and explain various components of cable stayed and cable suspended structures. **07**

(b) Write short note on the design principles for Plates, grids and framed structures. **07**

OR

Q.4 (a) Explain behaviour of Arch structures and cable structures with neat sketches. **07**

(b) Draw and explain the behavior of stress-strain curve of a mild steel bar subjected to tensile force. Showing all important points on it. **07**

Q.5 (a) Determine internal forces in all members of a truss shown in fig.2

07

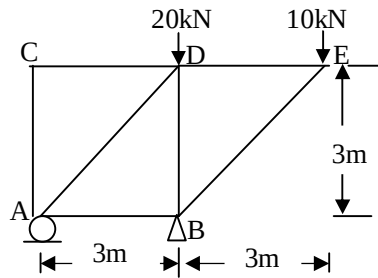


Fig.2

- (b)** A suspension cable of 100m horizontal span is supported at the same level at both the ends. It is subjected to a udl of 20kN per horizontal metre. If the maximum tension in the cable is limited to 4000kN, calculate the minimum central dip needed. **07**

OR

- Q.5 (a)** Explain general design principles for Design of Beams. **07**
(b) Explain the terms: Resolution of a force, composition of forces, free body diagram, resultant and equilibrant of a force system. **07**
