

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Diploma Architecture – SEMESTER - II • EXAMINATION – SUMMER 2015**

**Subject Code: 3326205****Date: 05-05-2015****Subject Name: Structure - I****Time: 10.30 am – 01.00 pm****Total Marks: 50****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of programmable & Communication aids are strictly prohibited.
5. Use of only simple calculator is permitted in Mathematics.
6. English version is authentic.

- Q.1** Explain the following terms: (Any five) **10**
1. Give differences between moment and couple.
  2. Time dependent and independent loadings.
  3. Explain Varignon's principle of moments.
  4. Equilibrium.
  5. Explain Lami's theorem.
  6. Resolution of forces.
  7. Earthquake load.
- Q.2 (a)** Define force and explain various force systems with illustrations. **03**
- OR**
- (a)** Discuss correlation between natural & manmade structure. **03**
- (b)** State Law of Parallelogram. **07**
- Two forces of 50 kN and 30 kN are acting at a point with an angle of 75° between them as shown in **Figure (1)**. Find the magnitude of the resultant and direction of the resultant force.
- Q.3 (a)** A sphere of 20 N is hanged as shown in **Figure (2)**. Find the tension (T) in the rope and reaction of wall (R). **10**
- OR**
- What are the equilibrium conditions used for analysis of any structural member and list out different types of beams? **10**
- Find out all possible reactions at both the supports of simply supported beam given in **Figure (3)**.
- Q.4 (a)** Develop the relationship between Load, Shear force and Bending moment. **03**
- (b)** Draw shear force and bending moment diagrams for the beam given in **Figure (4)**. **07**
- OR**
- (b)** Find out the magnitude and direction of resultant of the force system given in the **Figure (5)**. **07**
- Q.5 (a)** Enlist the types of stresses and strains. **03**
- (b)** A mild steel bar 20 mm in diameter 3.0 m long is subjected to an axial pull of 40 kN. Calculate stress; strain and final length of a bar, if  $E = 2 \times 10^5 \text{ N/mm}^2$ . **07**

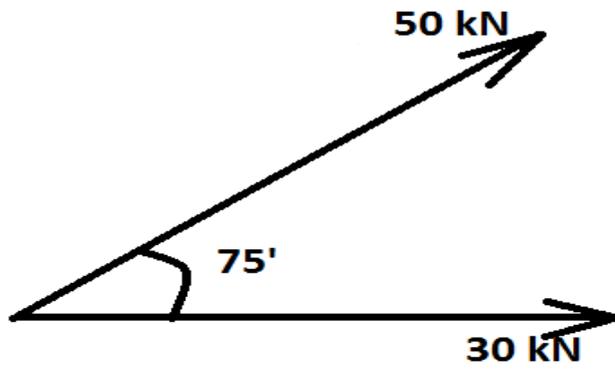


Figure (1)

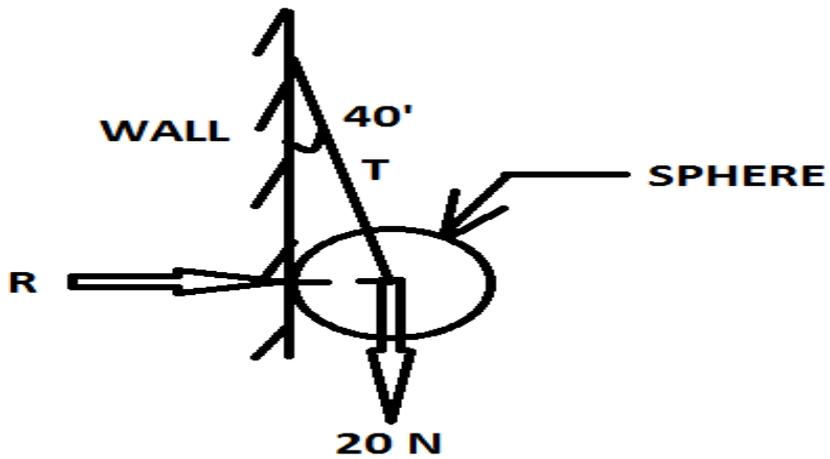


Figure (2)

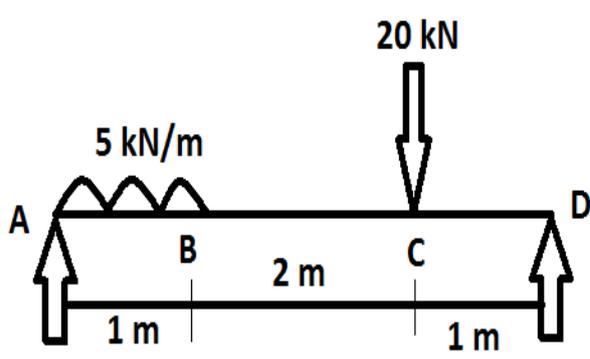


Figure (3)

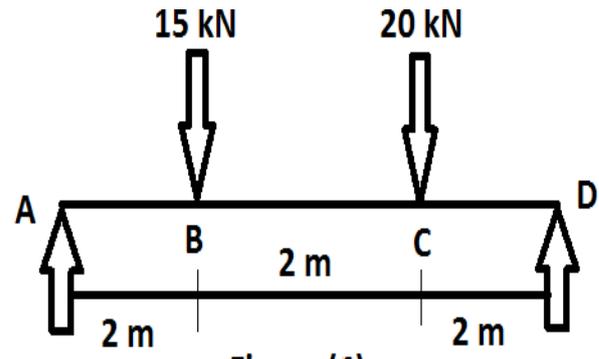


Figure (4)

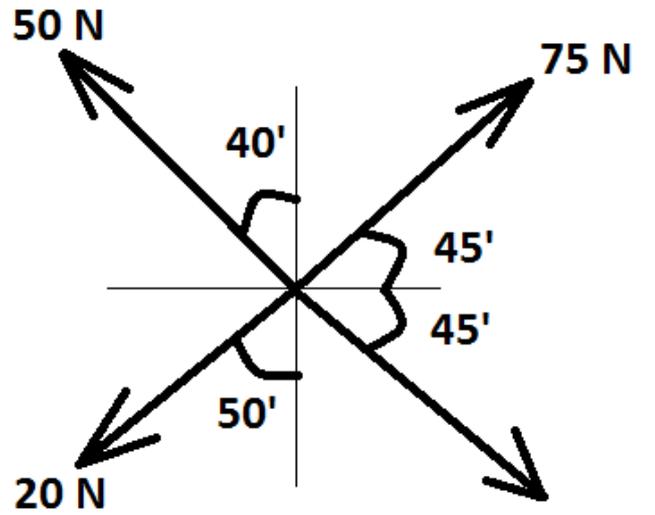


Figure (5)

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