## DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE
### End Semester Examination Dec - 2018

**Course:** B. Arch                                                   **Sem:** II
**Subject with code:** Theory of Structures – I (AR10200006S)
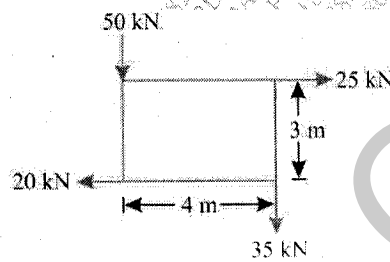**Date:** 14/05/2018               **Marks - 60**                          **Duration:** 3 Hrs.

***Instructions:***

1. *All questions are compulsory.*
2. *Neat sketches must be drawn wherever necessary.*
3. *Figures on the right indicate full marks.*
4. *Use of scientific calculator is allowed.*

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Q.1 (a) Define and explain Parallelogram Law of Forces                    (4)

    (b) A system of forces are acting at the corners of a rectangular block as shown in the figure.



Determine the magnitude and direction of the resultant force.        (6)

**OR**

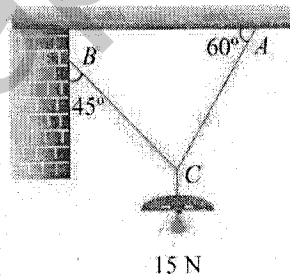Q.1 (a) Define system of forces.                                          (3)

    (b) An electric light fixture weighing 15N hangs from a point C, by two strings AC and BC. The string AC is inclined at 60° to the horizontal & BC at 45° to the vertical as shown. Using Lami's Theorem, determine the forces in the strings AC and BC.    (7)
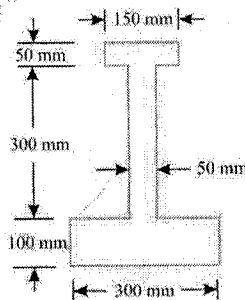


Q.2 (a) Define Center of Gravity.                                           (3)

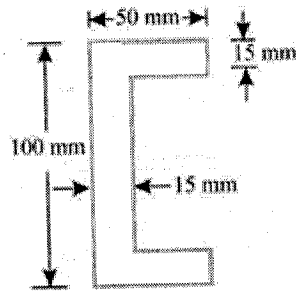    (b) Determine the center of gravity of an I-section with dimentions as shown in the figure.
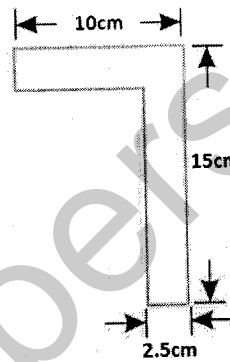
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**OR**

Q.2. (a) What is the Center of Gravity of (i) Rectangle (ii) Semi-Circle (iii) Triangle (3)

(b) Find the Center of Gravity of a channel section 100mm × 50mm × 15 mm (7)



Q.3. (a) Find the Moment of Inertia about the centroidal X-X and Y-Y axes of an inverted L-section 15cm × 10cm × 2.5cm (15)
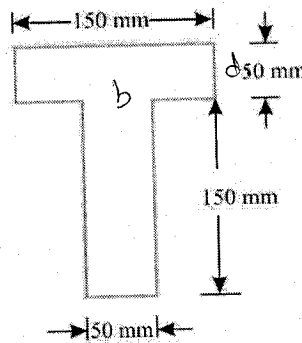


(b) Define Point Load, UDL and Uniformly Varying Load. (5)

**OR**

Q.3. (a) What is (i) Simply supported beam (ii) Over hanging beam (iii) Continuous Beam (iv) Fixed beam (v) Cantilever beam (5)

(b) Find the Moment of Inertia of a T-section shown in the figure about X-X and Y-Y axes through the center of gravity of the section (15)

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Q.4. (a) For beam loaded as shown in the figure, Draw Shear Force Diagram and Bending Moment Diagram. (15)
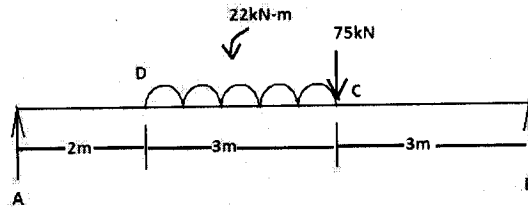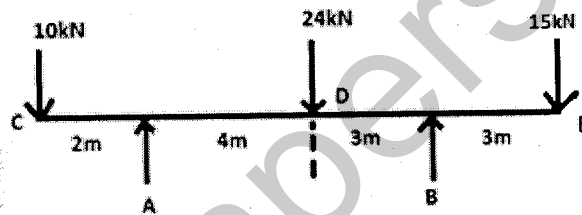


(b) What is the point of Contraflexure? Explain with Diagram. (5)

**OR**

Q.4. (a) For overhanging beam, determine support reactions at A and B. Draw Shear force diagram and Bending Moment Diagram. Find the point of contraflexure (20)



*** End ***