

**ANSWER ANY FIVE QUESTIONS ALL QUESTIONS CARRY EQUAL MARKS.****MARKS 16\*5=80**

1. (a) What is meant scheduling of a project? Explain its importance.  
(b) Explain the importance uses of stones.  
(c) What are the important properties of good bricks? Explain
2. (a) List the uses of plain cement concrete.  
(b) Explain any four important properties of hardened concrete.  
(c) What is Ferro cement? Explain the properties and uses of Ferro cement.
3. (a) What are composite materials? Explain their applications.  
(b) What is a total station? Explain its utility in surveying  
(c) What is remote sensing? Explain the applications of remote sensing.
4. (a) State and explain 'Principle of transmissibility'  
(b) Three forces acting on a hook are as shown in figure 4 (b). Determine the direction of the fourth force of magnitude 100N such that the hook is pulled in x direction only. Determine the result and force in x direction.  
(c) Figure 4 (c) shows a system of cables in equilibrium condition under two vertical loads of 300 N and 500 N. Determine the forces developed in the different segments.
5. (a) Explain the term 'couple moment' and list its characters.  
(b) Determine the resultant of the system of forces acting on a lamina as shown in figures 5 (b). Locate its x intercept from point O.  
(c) A ladder weighing 200N is to be kept in a position as shown in fig. 5(c) resting on a smooth floor and leaning against a smooth wall. Determine the horizontal force required to prevent it from slipping when a man weighing 700 N is at a height 2m above the floor level.
6. (a) Determine the centroid of a semi circle of radius R from first principle.  
(b) Locate the centroid of the shaded area shown in fig 6 (b) with respect to the axes shown.
7. (a) From the first principle, determine the moment of inertia of a triangle of base width 'b' and height 'h' about its base.  
(b) The strength of a 600mm deep and 250mm wide I beam of uniform thickness 10mm is increased by welding a 350mm wide and 20mm thick plate to its upper flange as shown in figure 7 (b). Determine the increase in moment of inertia of the section about the base AB.
8. (a) Explain the terms static friction, limiting friction and dynamic friction  
(b) State the laws of dry friction.  
(c) A ladder 5m long rests on a horizontal floor and leans against a smooth vertical wall at an angle of 70° with the floor. The weight of ladder is 900N. The ladder is at the verge of slipping when a man weighing 750N stands on it at a distance of 3.5m measured along the ladder from the top of ladder. Determine the coefficient of friction between the ladder and the floor.