16. (a) What is curing and how does it influence the strength of concrete?   **(5 Marks)**

    (b) List the advantages and uses of PSC and RCC.   **(5 Marks)**

17. (a) Distinguish between centroid and centre of gravity.   **(4 Marks)**

    (b) Find the reactions at the supports for the beam shown in figure 3.   **(6 Marks)**

18. (a) Define Rigid body and Free body diagram.   **(2 Marks)**

    (b) Determine the coordinates of the centroid of the plane lamina shown in figure 4 with respect to point A.   **(8 Marks)**

19. (a) What are the desirable properties of paints?   **(5 Marks)**

    (b) By using first principle find the moment of inertia of a circle about centroidal axis.   **(5 Marks)**

20. (a) State the laws of dry friction.   **(4 Marks)**

    (b) A ladder 5m long and weighing 250N is resting against a wall as shown in figure 5. A man weighing 800N climbs the ladder. How high will he be when the ladder slips. The coefficient of friction for all contact surfaces is 0.20   **(6 Marks)**

21. (a) Define work, power and energy.   **(3 Marks)**

    (b) A train of weight 1500kN is ascending a slope of 1 in 100 with a uniform speed of 36 km/hr. Find the power exerted by the engine, if the road resistance is 5N per kN weight of the train.   **(7 Marks)**
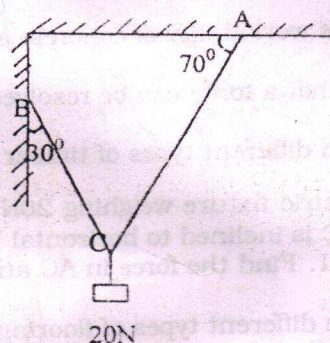
Figure.1