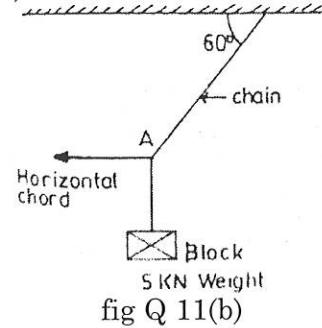
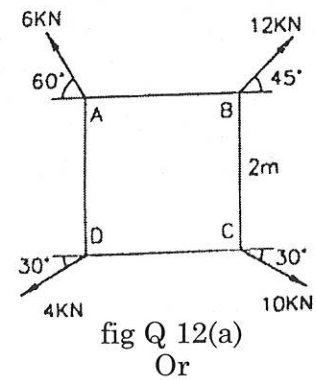


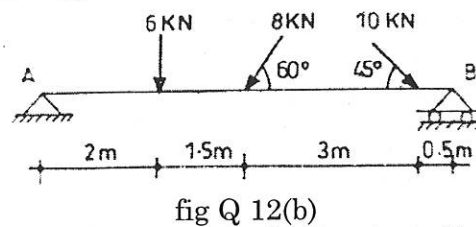
- (b) A block weighing 5kN is suspended from the ceiling by a chain. It is dragged aside by a horizontal chord until the chain makes 60° with the ceiling as shown in Fig.Q.11(b). Find the tension in the chain and in the chord.



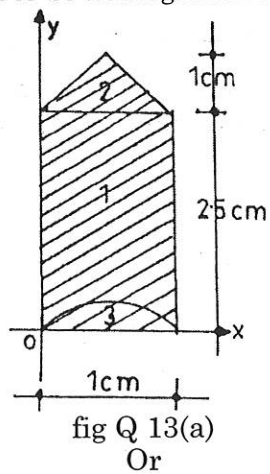
12. (a) Four forces of magnitude and direction acting on a square ABCD of side 2m are shown in fig Q 12(a). Calculate the resultant in magnitude and direction and also locate its point of application with respect to the sides AB and AD.



- (b) Determine the support reactions of the beam shown in fig Q 12(b) below



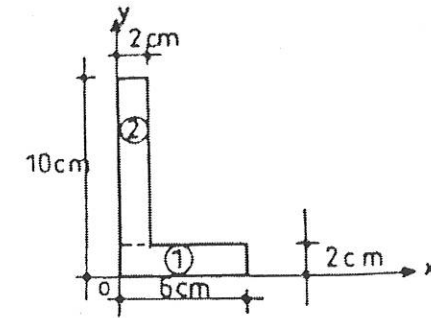
13. (a) Locate the center of gravity of a bullet, 1 cm diameter with a cone on the front and a hemisphere cut from the back as shown in fig Q 13(a) below. Assume the material to be homogeneous.



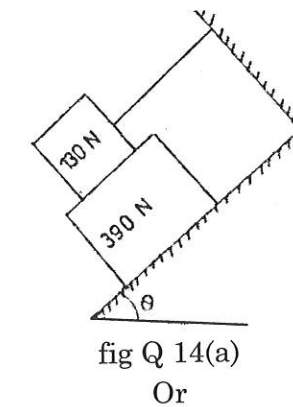
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- (b) Calculate the moment of inertia of L section shown in fig Q 13(b) below about the horizontal axis passing through the C.G.

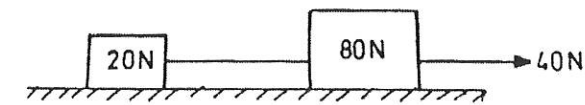


14. (a) What should be the value of the angle θ so that motion of the 390N block as shown in Fig.Q.14(a) impends down the plane? The coefficient of friction for all surfaces is 1/3.



- (b) A 7m long ladder rest against a vertical wall, with which it makes an angle of 45° and on a floor. If a man whose weight is one half that of ladder climbs it, at what distance along the ladder will he be, when the ladder is about to slip? Take coefficient of friction between the ladder and the wall is 1/3 and that between the ladder and the floor is 1/2.

15. (a) Two weights 80 N and 20 N are connected by a thread and more along a rough horizontal plane under the action of a force 40 N, applied to the first weight of 80 N as shown in Fig Q 15 (a). The coefficient of friction between the sliding surface of the weights and the plane is 0.3. Determine the acceleration of the weight and the tension in the thread using work energy equation.



Or

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