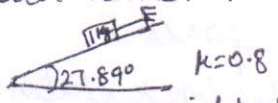
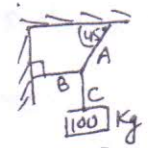
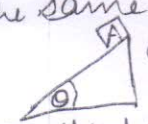

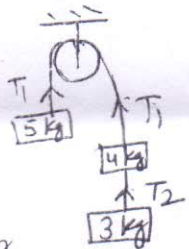


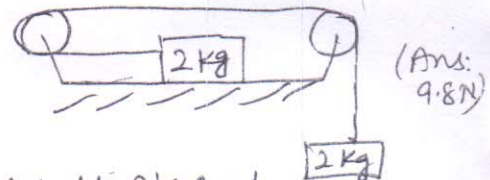
ASSIGNMENT (9)

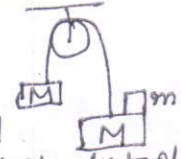
1. A body of mass 1 kg is acted upon by two forces, each of magnitude 1 N, making an angle of 60° with each other. Find the net acceleration of the body.  (Ans: $T=0$)
2. Find tension in the string
3. An elevator is moving up with an acceleration $\frac{g}{5}$. Find the apparent weight of a 60 kg man standing in the lift. (Take $g=10 \text{ m/s}^2$). (Ans: 720 N)
4. A body released from the top of a smooth inclined plane reaches the bottom of plane in 4 seconds. Find the time taken by the body to cover the first half of the inclined plane. (Ans: $2\sqrt{2}$ s)
5. Find the tension in strings A, B and C.  (100/2g, 100g, 100g)
6. A 10g clay ball moving with a velocity of 10 cm/s due east collides head on with 10g clay ball moving with a velocity of 20 cm/s due west. The two balls coalesce after collision. Find the velocity of combined mass.
7. A block A slides down a smooth inclined plane when released from the top in time t. Another block falls freely from the same point and strikes the ground in time t/2. Find angle θ .  (Ans: 30°)
8. A bomb explodes in air when it has a horizontal speed of 100 km/h. It breaks into two pieces A, B of mass ratio 1:2. If A goes vertically at speed of 400 km/h find the speed of B. (Ans: 250 km/h)
9. Ignoring friction find T_1/T_2 .  (Ans: 5:1)

10. Find T_1 and T_2 .

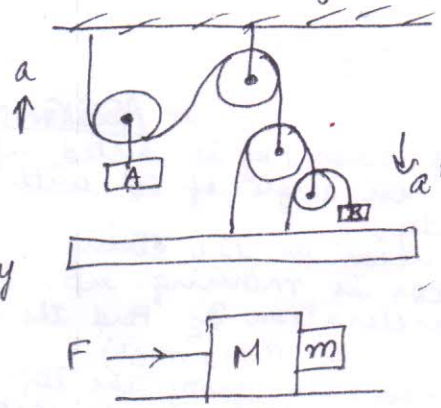


11. Find tension in the string (ignore friction)



12. With what acceleration 'a' should a box descend so that a block of mass M placed in it exerts a force $\frac{Mg}{2}$ on the floor of the box? (Ans: $\frac{3g}{4}$)
13. A hunter has a machine gun that can fire 50g bullets with a velocity of 900 m/s. A 40 kg tiger springs at him with a velocity of 10 m/s. How many bullets must the hunter fire into the tiger in order to stop him in his track? (Ans: 9)
14. A rocket burns 50g of fuel per second ejecting it as a gas with a velocity of $5 \times 10^5 \text{ cm/s}^{-1}$. What force is exerted by the gas on the rocket? (Ans: 250 N)
15. A monkey of mass 20 kg is holding a vertical rope. The rope will not break when a mass of 25 kg is suspended from it but will break if the mass exceeds 25 kg. Find the maximum acceleration with which the monkey can climb up along the rope. ($g=10 \text{ m/s}^2$)
16. Two identical weights of mass M are linked by a thread wrapped around a pulley block with a fixed axis. A small weight of mass m is placed on one of the weights. Find the acceleration with which the weights move. 
17. An empty plastic box of mass 5 kg is observed to accelerate up at the rate of $\frac{g}{6}$ when placed deep inside water. What mass of sand should be put inside the box so that it may accelerate down at the rate of $\frac{g}{6}$? (Ans: 2 kg)

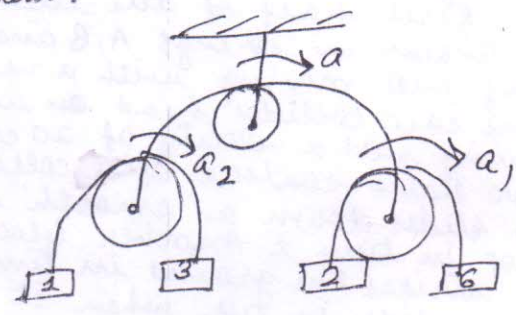
18. If block A is going upwards with acc. a , find that of B. (8a)
 $m_A = m_B = m$.



$$(M+m) \frac{g}{\mu}$$

19. Coefficient of friction b/w wedge (M) and block (m) is μ . Find minimum force F required to keep the block stationary w.r.t. wedge.

20. Find T and a of the system?



$$(40N, \frac{10}{3} m/s^2)$$