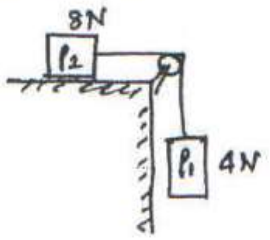
MAY JUNE 2017

c) of weight 8 KN moving from rest with constant acceleration acquires an upward velocity of 4m/s over a distance of 5m. Determine the tension in the cables supporting the lift. [4]

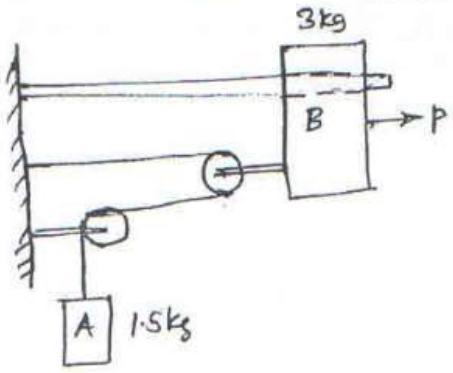
b) A 50 kg block kept on the top of a 15^0 sloping surface is pushed down the plane with an initial velocity of 20 m/s. If $\mu_k = 0.4$, determine the distance traveled by the block and the time it will take as it comes to rest. [6]

MAY JUN 2017

e) Blocks P_1 and P_2 are connected by inextensible string. Find velocity of block P_1, if it falls by 0.6m starting from rest. The coefficient of friction is 0.2, pulley is friction less. **04**



d) The system shown in fig is initially at rest. Neglecting friction determine the force 'P' required if the velocity of the collar B is 5 m/s after 2 sec and corresponding tension in the cable. **04**



DEC 2016

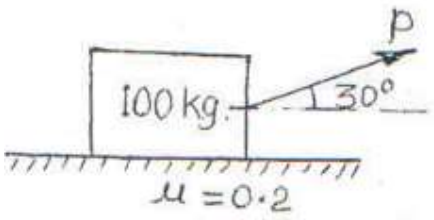


Fig No. 4

(e) A 100 kg block resting on horizontal plane is pulled by force P to accelerate the block at 3 m/s2 to right hand side as shown in fig No. 4. Determine P. [4]

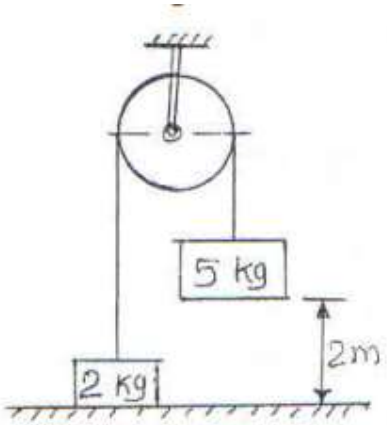


Fig No. 15

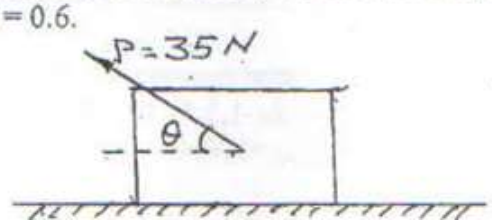
(d) Two masses are positioned as shown in fig No. 15. If 5 kg mass is released from rest, find the speed at which 5 kg mass will hit the ground. [4]

DEC 2016

c. **Three blocks A, B and C of masses 3kg, 2kg and 7kg respectively are connected as shown. Determine the acceleration of A, B and C. Also find the tension in the strings** [6]

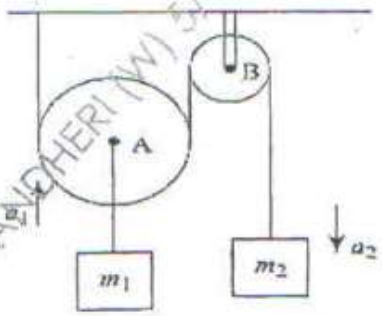
MAY JUNE 2016

e. Find the angle the force P makes with horizontal such that the block of mass 4 kg has an acceleration of 10m/sec^2, when it is subjected to a force of 35 N. [4]
$\mu s = 0.7$, $\mu k = 0.6$.



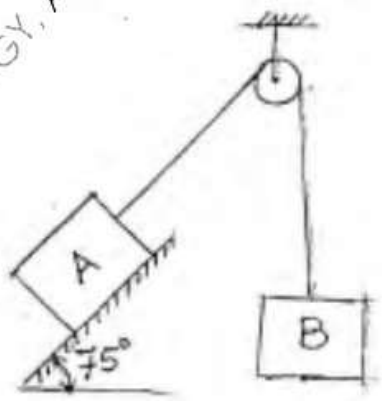
[TURNOVER

d. Two masses are interconnected with the pulley system Neglecting inertial & frictional effect of pulleys & cord, determine the acceleration of the mass m_2. [4]
Take $m_1 = 50$ kg & $m_2 = 40$ kg



DEC 2015

d) Block A and B of mass 6kg and 12kg respectively are connected by a string passing over a smooth pulley. Neglect mass of pulley. If coefficient of kinetic friction between the block A and the inclined surface is 0.2, determine the acceleration of block A and block B. [4]



MAY 2015

e) The 550 N box (Fig. 4) rests on a horizontal plane for which the coefficient of kinetic friction μ_k = 0.32. If the box is subjected to a 400 N towing force as shown, find the velocity of the box in 4 seconds starting from the rest. 4

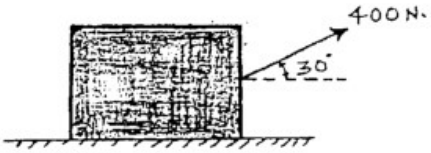


Fig. 4

[TURN OVER

d) Two masses of 60 N. & 30 N. are positioned over frictionless & massless pulley (Fig. 15). If the 60 N. mass is released from rest, find the speed at which the 60 N. mass will hit the ground. 4

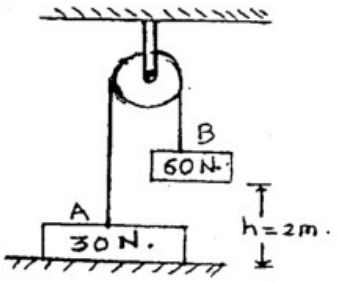
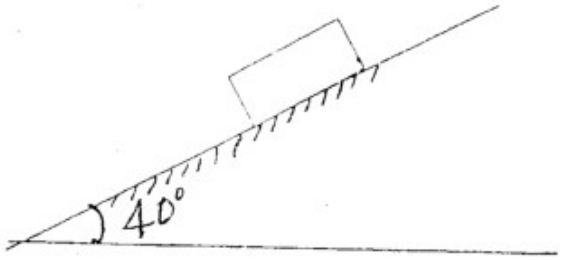


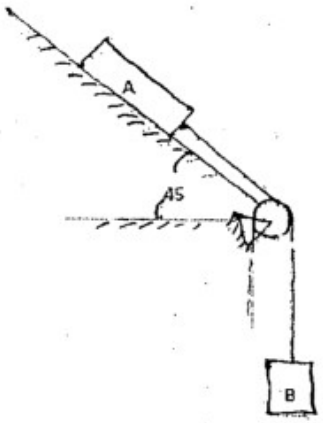
Fig. 15

DEC 2015

e. A block of mass 5kg is released from rest along a 40 degree inclined plane. [4]
Determine the acceleration of the block when it travels a distance of 3m using D'Alemberts principle. Take coefficient of friction as 0.2.



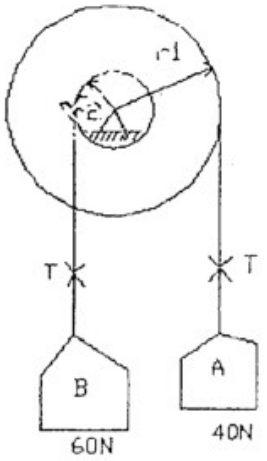
d. Twoblocks A and B connected as shown in the diagram. The string is [4]
inextensible. Mass of A and B are 3kg and 5kg respectively. If the coefficient of friction between A and inclined plane is 0.25 determine the tension on the strings and accelerations of A and B.



MAY 2014

e) A motorist travelling at a speed of 90kmph suddenly applies the brakes and comes to rest after skidding 100 m. Determine the time required for the car to stop and coefficient of kinetic friction between the tires and the road. [4]

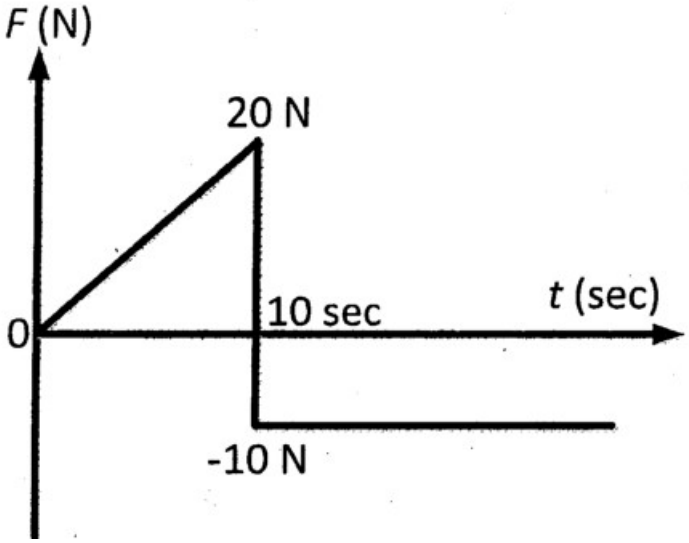
d) A two step pulley supports two weights A=40N and B=60N as shown. Find the downward acceleration of A if radius of bigger pulley is double that of the smaller one. Neglect friction and inertia of pulley. [4]



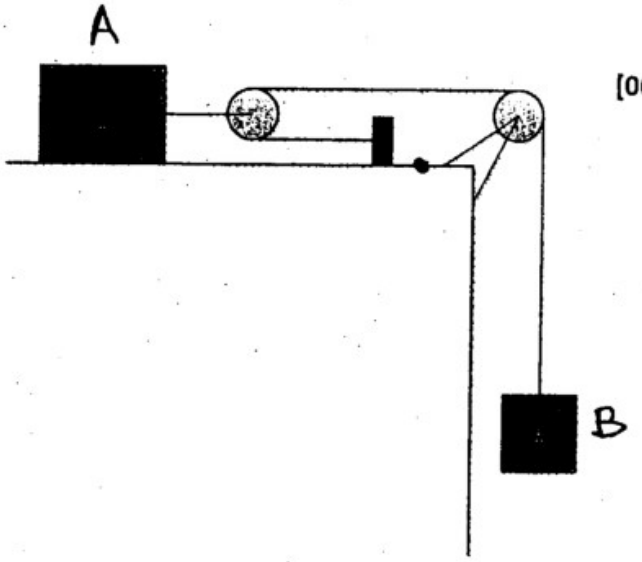
DEC 2013

(e) A 50 kg block kept on a 15^0 inclined plane is pushed down the plane with an initial velocity of 20 m/s. If $\mu_k = 0.4$, determine the distance traveled by the block and the time it will take as it comes to rest. **[04]**

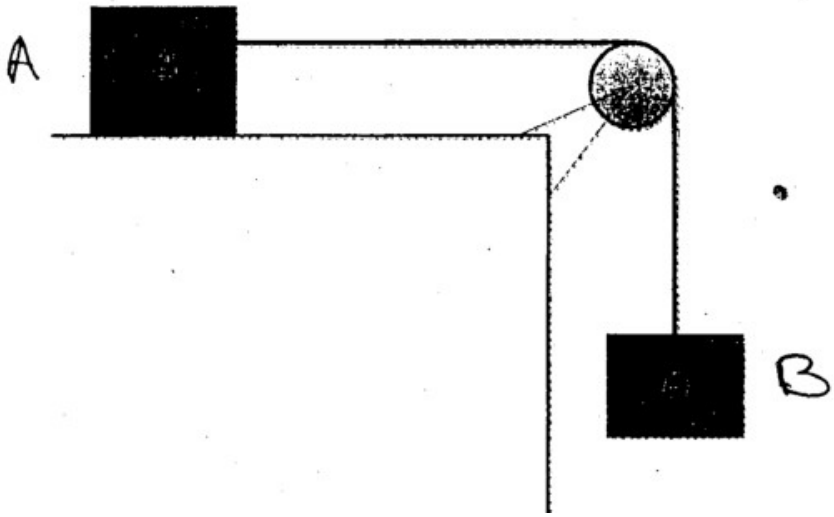
(c) A particle of mass 1 kg is acted upon by a force F which varies as shown in figure. If initial velocity of the particle is 10 m/s determine (i) what is the maximum velocity attained by the particle. (ii) Time when particle will be at the point of reversal. **[06]**



(c) Two blocks m_A=10 kg and m_B=5 kg are connected with cord and pulley system as shown in figure. Determine the velocity of each block when system is started from rest and block B gets displacement by 2 m. Take μ_K=0.2 between block A and Horizontal surface. [06]



(d) A body of mass 25 kg resting on a horizontal table is connected by string passing over a smooth pulley at the edge of the table to another body of mass 3.75 kg and hanging vertically as shown. Initially, the friction between the mass A and the table is just sufficient to prevent the motion. If an additional 1.25 kg is added to the 3.75 kg mass, find the acceleration of the masses. [04]



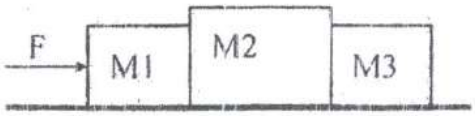
MAY 2013

(e) State D'Alembert's principle with two examples. 4

DEC 2012

e) A vertical lift of total mass 750kg acquires an upward velocity of 3m/s over a distance of 4m moving with constant acceleration starting from rest. Calculate the tension in the cable. [04]

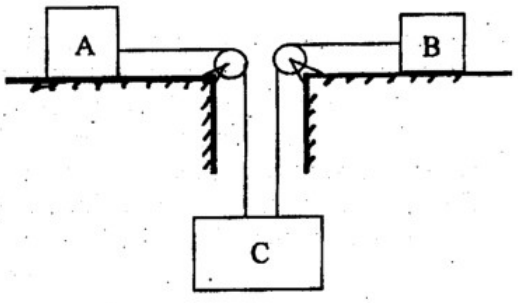
d) Three m_1, m_2 & m_3 of masses 1.5Kg, 2Kg & 1Kg respectively are placed on a rough surface with $\mu = 0.20$. as shown. If a force F is applied to accelerate the blocks at $3m/s^2$, what will be the force that 1.5Kg block exerts on 2Kg block? [04]



DEC 2010

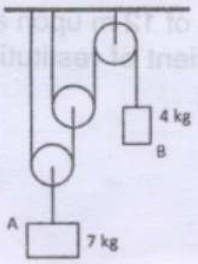
1C). The velocity of a particle travelling in a straight line is given by $v = 6t - 3t^2$ m/s. Where t is in seconds. If s = 0when t = 0, determine the particle's deceleration and position when t =3s. How far has the particle travelled during the 3 second time interval and what is its average speed? **(05 Marks)**

7B) Masses A(5kg), B (10kg), C (20kg) are connected as shown in the figure by inextensible cord passing over massless and frictionless pulleys. The coefficient of friction for masses A and B with ground is 0.2. If the system is released from rest, find the acceleration of the blocks and tension in the cords. **(12 marks)**



MAY JUN 2010

4. (a) Determine the tension developed in chords attached to each block and the accelerations of the blocks when the system shown is released from rest. Neglect the mass of the pulleys and chords. 12



5. (a) Two blocks A (mass 10 kg), B (mass 28 kg) are separated by 12 m as shown in the **figure**. If the blocks start moving, find the time 't' when the blocks collide. Assume $\mu = 0.25$ for block A and plane and $\mu = 0.10$ for block B and plane. 12