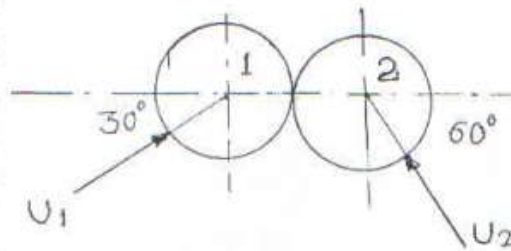


MAY JUNE 2017

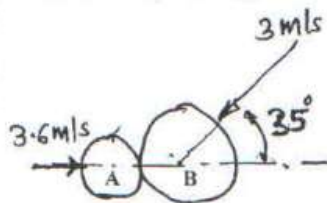
- Q2 a) Two smooth spheres 1 and 2 having a mass of 2 Kg and 4 Kg respectively [8]
collide with initial velocities as shown in fig. if the co-efficient of restitution for the spheres is $e=0.8$, determine the velocities of each sphere after collision. Angles made by velocities U_1 and U_2 with line of impact are 30° and 60° respectively.



- c) The batsman hits a ball of 150 grams coming to him straight with a speed of [6]
72kmph at an angle of 45° with horizontal and velocity of hit is 216 kmph.
Find the average force exerted by the bat on the ball if the impact lasts for 0.02
sec.

MAY JUNE 2017

- c) Just before they collide, two disk on a horizontal surface have velocities shown in fig. Knowing [6]
that 90N disk 'A' rebounds to the left with a velocity of 1.8 m/s. Determine the rebound
velocity of the 135 N. disk 'B'. Assume the Impact is perfectly elastic.



DEC 2016

- e. A glass ball is dropped onto a smooth horizontal floor from which it bounces to a
height of 9m. On the second bounce it rises to a height of 6m. From what height the
ball was dropped and what is the coefficient of restitution between the glass and the
floor.

[4]

MAY JUNE 2016

- c. Prove that for a perfectly elastic body, two equal masses participating in collision exchange their velocities. [6]

DEC 2015

- c) Two balls with masses 20kg and 30kg are moving towards each other with velocities 10m/s and 5m/s respectively. If after impact the ball having mass 30kg reverses its direction of motion and moves with velocity 6m/s, then determine the coefficient of restitution between the two balls. [6]

MAY 2015

- c) Define the terms with neat sketches: Direct impact, oblique impact & line of impact. 6

DEC 2014

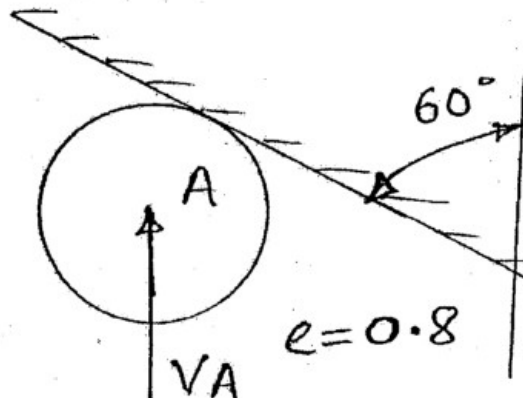
- c. If a ball is thrown vertically down with a velocity of 10 m/s from a height of 3m. Find the maximum height it can reach after hitting the floor, if the coefficient of restitution is 0.7. [6]

MAY 2014

- c) A ball of mass 'm' hits directly to a similar ball of mass 'm' which is at rest. The velocity of first ball after impact is zero. Half of the initial kinetic energy is lost in impact. Find coefficient of restitution. [6]

MAY 2013

- (c) A ball of mass m kg hits an inclined smooth surface with a velocity $V_A = 3$ m/s. Find out velocity of rebound. 6



DEC 2012

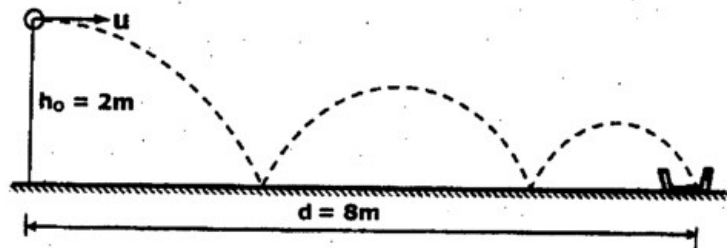
(c) A body of mass 2kg is projected upwards from the surface of the ground at $t=0$ with velocity 20m/s. At the same time another body of mass 2 kg is dropped along the same line from a height of 25m. If they collide elastically, find the velocities of body A and B just after collision. [6]

DEC 2010

1D). A boy throws a ball vertically downwards from a height of 1.5m. He wants the ball to rebound from floor and just touch the ceiling of room which is at a height of 4m from ground. If coefficient of restitution e is 0.8, find the initial velocity with which the ball should be thrown. (05 Marks)

3C). State Work Energy Principle & Law of conservation of Momentum principle. (04 marks)

6B). A small steel ball is to be projected horizontally such that it bounces twice on the surface and lands into a cup placed at a distance of 8m as shown. If the coefficient of restitution for each impact is 0.8, determine the velocity of projection 'u' of the ball. (12 marks)



MAY JUN 2010

(e) A ball is dropped from a height of 12 m upon a horizontal slab. If it rebounds to height of 4 m. Find coefficient of restitution. 5

(b) Two identical balls of 120 gm collide when they are moving with velocities as shown in figure. Determine the velocities of ball A and B completely after the impact. Take $e = 0.8$. 8

