(EPC03-0001H)

- A car moving on a straight road covers one third of the distance with 20 km/h and the rest with 60 km/h. The average speed is

A) 40 km/h
B) 80 km/h
C) $46\frac{2}{3}$ km/h
D) 36 km/h

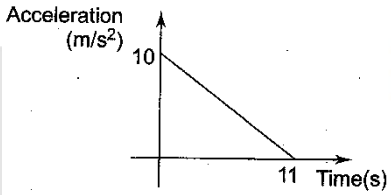
(EPC03-0002E)

- If the displacement of a particle is directly proportional to the square of time. Then particle is moving with

A) Uniform acceleration
B) Variable acceleration
C) Uniform velocity
D) Variable acceleration but uniform velocity

(EPC03-0003E)

- A particle starts from rest. Its acceleration (a) verus time (t) is as shown in Figure. The maximum speed of the particle will be:



A) 110 m/s
B) 55 m/s
C) 550 m/s
D) 660 m/s

(EPC03-0004E)

- When two bodies move towards each other with constant speeds, the distance between them decreases at the rate of 6 m/s. If they move in the same direction with the same speeds, the distance between them increases at the rate of 4 m/s. Then their speeds are

  A) 5 m/s and 1 m/s
  B) 3 m/s and 3 m/s
  C) 4 m/s and 2 m/s
  D) none of the above

(EPC03-0005M)

- A stone is dropped from a height h. Simultaneously, another stone is thrown up from the ground which reaches a height $4h$. The two stones cross each other after time

  A) $\sqrt{\frac{h}{2g}}$
  B) $\sqrt{\frac{h}{8g}}$
  C) $\sqrt{8hg}$
  D) $\sqrt{2hg}$

(EPC03-0006M)

- The speed with which a ball should be thrown down, so that it bounces 10 m higher than its original level, assuming no energy loss in striking the ground, is

  A) 10 m/s
  B) 14 m/s
  C) 20 m/s
  D) None of the above

(EPC03-0007M)

- Starting from rest and moving with a constant acceleration, a body covers a certain distance in time t. It covers the second half of the distance in time

A) $\frac{t}{\sqrt{2}}$
B) $\frac{t}{\sqrt{3}}$
C) $t\left(1-\frac{1}{\sqrt{2}}\right)$
D) $t\left(1-\frac{1}{\sqrt{3}}\right)$

(EPC03-0008E)

- A stone, thrown vertically upwards from the top of a tower with an initial velocity u, reaches the ground with a velocity $3u$. The height of the tower is

A) $\frac{3u^2}{g}$
B) $\frac{4u^2}{g}$
C) $\frac{6u^2}{g}$
D) $\frac{9u^2}{g}$

(EPC03-0009M)

- A body starts from rest with uniform acceleration. If its velocity after n seconds is v, then its displacement in the last two seconds is

A) $\frac{2v\,(n-1)}{n}$
B) $\frac{v\,(n-1)}{n}$
C) $\frac{v\,(n+1)}{n}$
D) $\frac{2v\,(2n+1)}{n}$

(EPC03-0010E)

- A body, released from the top of a tower of height h, takes time t to reach the ground. At time $t/2$ its height from the ground was

  A) $h/4$
  B) $h/3$
  C) $h/2$
  D) $3h/4$

(EPC03-0011H)

- A ball is dropped from a great height. One second later, another ball is dropped from the same height. The distance between them 3 s after the first ball is dropped is (g = 10 m/s^2)

  A) 25 m
  B) 20 m
  C) 50 m
  D) 10 m

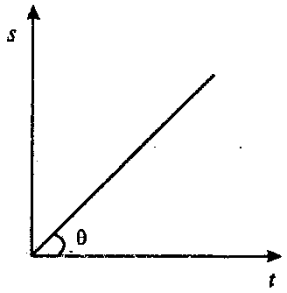
(EPC03-0012E)

- A car travels for a certain time. Its speed during the first half time is v_1 and that during the second half time is v_2. Find the average speed.

  A) $v_1 + v_2$
  B) $\frac{v_1 + v_2}{2}$
  C) $\frac{2}{v_1 + v_2}$
  D) $\frac{2v_1v_2}{v_1 + v_2}$

(EPC03-0013E)

- The displacement-time graphs for two particles A and B are straight lines inclined at 60° and 30° to the time axis. Find the ratio of their speeds.



A) $\sqrt{3}$
B) 3
C) $\frac{1}{\sqrt{3}}$
D) $3 + \sqrt{3}$

(EPC03-0014H)

- A car accelerates from rest at a constant rate α for sometime after which it accelerates at a constant rate β to come to rest. If the total time lapse is t seconds, find the total distance travelled.

A) $\frac{\alpha\beta}{\alpha+\beta}t$
B) $\frac{\alpha\beta t^2}{2(\alpha+\beta)}$
C) $\frac{\alpha\beta t^2}{2(\alpha-\beta)}$
D) $\frac{\beta}{\alpha+\beta}t^2$

(EPC03-0015E)

- A ball is projected vertically upwards form the ground with a velocity of 20 m/s. How long will it take to reach the highest point? (Take $g = 10$ m/s^2)

A) 1 s
B) 3 s
C) 2 s
D) 4 s

(EPC03-0016M)

- Two masses, each equal to m, are attached to one another by a massless string passing over a smooth pulley. The tension in the string is

  A) mg
  B) 2mg
  C) mg/2
  D) zero

(EPC03-0017E)

- A ball of mass 0.1 kg strikes a wall normally with a speed of 30 m/s and rebounds with a speed of 20 m/s. The impulse of the force exerted by the wall on the ball is

  A) 1 NS
  B) 5 NS
  C) 2 NS
  D) 3 NS

(EPC03-0018M)

- A Cricket ball of mass 150 g is moving with a velocity of 12 m/s and is hit by a bat so that the ball is turned back with a velocity of 20 m/s. The force of blow acts for 0.01 s on the ball. Find the average force exerted by the bat on the ball.

  A) 710 N
  B) 670 N
  C) 540 N
  D) 480 N

(EPC03-0019M)

- A bomb of mass 12 kg, initially at rest, explodes into two pieces of masses 4 kg and 8 kg. The speed of the 8 kg mass is 6 m/s. The kinetic energy of the 4 kg mass is

  A) 32 J
  B) 48 J
  C) 114J
  D) 288 J

(EPC03-0020H)

- 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 up at a speed of 400 km/h, the speed of B is

  A) 200 km/h
  B) 250 km/h
  C) 300 km/h
  D) 500 km/h

(EPC03-0021M)

- A 6 kg box sled is travelling on ice at a speed of 9 m/s when a 12 kg packet is dropped into it vertically. The velocity of the sled will now be

  A) 3 m/s
  B) 4 m/s
  C) 6 m/s
  D) 8 m/s

(EPC03-0022M)

- A metal ball of mass 2 kg, moving with speed of 36 km/h, has a head-on collision with a stationary ball of mass 3 kg. If, after the collision, the two balls move together, the loss in K.E. due to collision is

  A) 40 J
  B) 60 J
  C) 100 J
  D) 140 J

(EPC03-0023M)

- A ball moving with velocity of 9 m/s collides with another similar stationary ball. After the collision, both the balls move in directions making an angle of 30^{o} with the initial direction. After the collision their speed will be

  A) 2.6 m/s
  B) 5.2 m/s
  C) 0.52 m/s
  D) 52 m/s

(EPC03-0024M)

- A moving particle of mass m makes a head-on elastic collision with a particle of mass $2m$ which is initially at rest. The fraction of the initial kinetic energy lost by the colliding particle is

  A) 1/9
  B) 2/9
  C) 4/9
  D) 8/9

(EPC03-0025M)

- A block of mass 1 kg, moving with a speed of 4 m/s, collides with another block of mass 2 kg which is at rest. The lighter block comes to rest after collision. The loss in the kinetic energy of the system is

  A) 8 J
  B) 4×10^{-7} J
  C) 4 J
  D) none of these

Answer key	
1	D
2	A
3	B
4	A
5	B
6	B
7	C
8	B
9	A
10	D
11	A
12	B
13	B
14	B
15	C