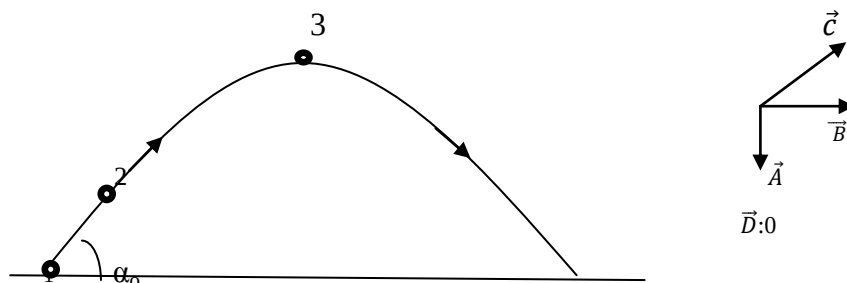


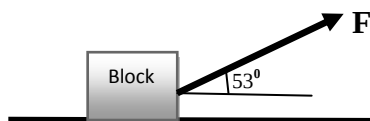
- Uniform circular motion is a:(UEE:2003)
 - Motion with constant velocity.
 - Motion in one dimension.
 - motion with acceleration of constant magnitude.
 - motion in which net force is constant
- An object of mass m moving with initial speed of 15m/s got an acceleration of 10m/s^2 after a constant force $\mathbf{F}$ is applied to it. How long does it take for the object to reach 90m from its initial position:(UEE:2003)
 - 3.22 s.
 - 0.75 s.
 - 3 s.
 - 2.5 s
- A 4 kg block is given an initial speed of 8m/s at the bottom of 30° inclined plane. The fictional force that retards its motion is 15 N . If the block directed up the inclined plane, how far will it move before it stops? (UEE: 2003).
 - 3.35m
 - 3.66m.
 - 4.40m.
 - 4.67m.
- A ball is thrown downward (not dropped) from the top of a tower. After being released, its downward: (UEE:2003)
 - Velocity will be uniform.
 - Acceleration will be equal to g .
 - Acceleration will be greater than g .
 - Acceleration will be smaller than g .
- A small car and a bus move with velocities given by $\mathbf{V}_c = (3\hat{i} - 2\hat{j})\text{ m/s}$ and $\mathbf{V}_b = (-5\hat{i} - 4\hat{j})\text{ m/s}$ respectively according to an observer on the ground. What is the velocity of the bus according to a car driver? (UEE: 2003).
 - $(-2\hat{i} + 6\hat{j})\text{ m/s}$.
 - $(-2\hat{i} - 6\hat{j})\text{ m/s}$.
 - $(-8\hat{i} + 2\hat{j})\text{ m/s}$.
 - $(-8\hat{i} - 2\hat{j})\text{ m/s}$.
- A car initially at rest and at the origin has moved a distance of $5, 10, 15, 20, 25, 30, 40, 50, 60, 70$ meters during the $1, 2, 3, \dots, 10$ seconds periods respectively. What is the average speed during the first 5 second and the second half period from $t = 6$ seconds to $t = 10$ second in m/s respectively? (UEE:2003)
 - 4, 10.
 - 4, 9.
 - 5, 9.
 - 5, 10.
- A bullet is fired from cannon at point 1 and follows the trajectory shown in the figure below. Air resistance may neglect. Four possible vectors are also shown in the figure; the letter D represents the zero vector. Which vector best represents the bullets acceleration at point 2?(UEE: 2003)
 - $\hat{A}$.
 - $\hat{B}$.
 - $\hat{C}$.
 - $\hat{D}$



- As shown below, an ideal massless spring is compressed 1m by a force of 100 N . This same spring is placed at the bottom of a frictionless inclined plane which makes an angle of $\Theta = 30^\circ$ with the horizontal. A 10 kg mass M is released from rest at the top of the inclined and is

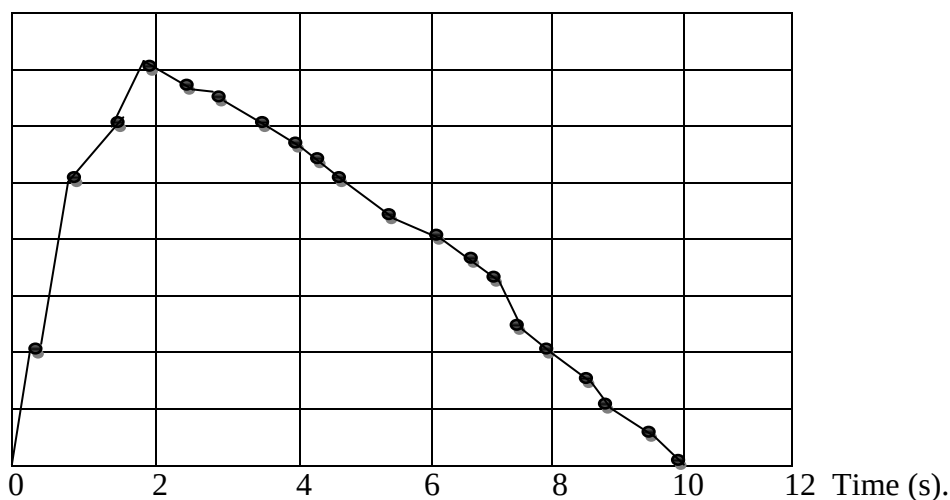
- brought to rest momentarily after compressing the spring 2m. Through what distance does the mass slide before coming to rest? (UEE: 2003)
- A. 1 m. B. 2 m. C. 4 m. D. 6 m.
9. The x and y coordinates of a particle at any time t is given by $x = 9t + 5t^2$ and $y = 5t + 8$ where x and y are in meters and t in seconds. The acceleration of the particle at $t = 5$ seconds is : (UEE: 2003) A. zero. B. 10m/s^2 . C. 14 m/s^2 . D. 20 m/s^2 .
10. A projectile is fired at 600 with the horizontal. At the highest point of its path, the vertical component of its velocity is momentarily zero. What is the magnitude of its acceleration at this point?(UEE:2004)
- A. 20 m/s^2 . B. 10 m/s^2 . C. 5 m/s^2 . D. 0 m/s^2 .
11. A cart on an air track is moving at 0.5 m/s when the air is suddenly turned off. The cart comes to rest after traveling 1 m. The experiment is repeated, but now the cart is moving at 1 m/s when the air is turned off. How far does the cart travel before coming to rest?(UEE: 2004). A. 1 m. B. 2 m. C. 3 m. D. 4 m.
12. A car accelerates steadily from 0 m/s to 30 m/s in a distance d and a time t. Another car takes a time 3t to accelerate steadily from stationary to the same final velocity. What distance does the second car cover during the new acceleration?(UEE: 2004).
- A. 3d. B. d. C. $d/3$. D. $d/9$
13. A object moving with uniform acceleration has a velocity of 12 m/s in the positive x direction when its x coordinate is 3 cm. If its x coordinate 2 sec. later is -5 cm, what is its acceleration? (UEE: 2004).
- A. -12 m/s^2 . B. -13 m/s^2 . C. -16 m/s^2 . D. 12 m/s^2 .
14. What is the direction to which a fish must push the water with its fins in order to propel eastward? (UEE: 2005).
- A. eastward. B. upward. C. westward. D. downward.
15. A woman driving a 2000 kg car along a level road at 30 m/s takes her foot off the gas to see how far her car will roll before it slows to a stop. She discovers that it takes 150 m. What is the average force of friction acting on the car? (UEE: 2005).
- A. 9000 N. B. 6000 N. C. 3000 N. D. 400 N.
16. The coordinate of a particle in meters is given by $x(t) = 25t - 3t^3$, where the time t is in seconds. At what value t will the particle become momentarily at rest? (UEE: 2005).

23. A body moving with constant acceleration covers the distance between two points 60m apart in 5s. Its velocity as it passes the second point is 15m/s. What is the acceleration? (UEE:2006).
- A. 3 m/s^2 . B. 2.4 m/s^2 . C. 1.8 m/s^2 . D. 1.2 m/s^2 .
24. If a long distance jumper athlete leaves the ground at an angle of 37° above the horizontal surface at a speed of 10 m/s, how far does he jump in the horizontal direction? (UEE:2007)
- A. 4.8 m. B. 6 m C. 9.6 m. D. 12 m.
25. A woman is rotating a bucket of water in a vertical circle of radius 0.9 m, the mass of bucket and water is 5 kg. What is the bucket's minimum speed at the top of the circle if no water is to spill out? (UEE: 2007). A. 0 B. 1 m/s. C. 3 m/s. D. 9 m/s.
26. A force F of magnitude 20 N is applied to a block of mass 2 kg that lies on a rough, horizontal surface as shown in figure below. The coefficient of kinetic friction between the block and surface is 0.4. What is the magnitude of the acceleration of the block?(UEE: 2007)
- A. 10 m/s^2 .
B. 5.2 m/s^2 .
C. 4 m/s^2 .
D. 2.8 m/s^2 .



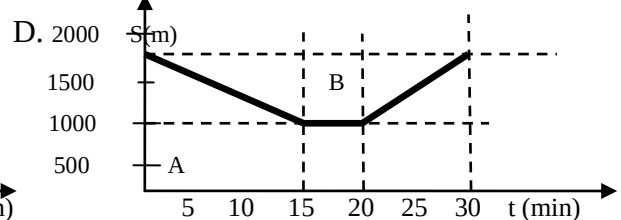
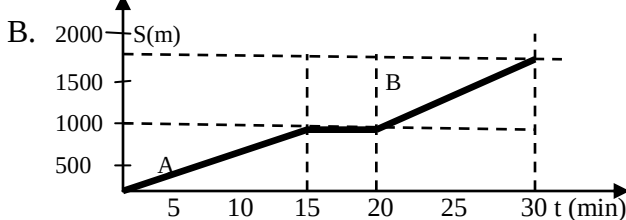
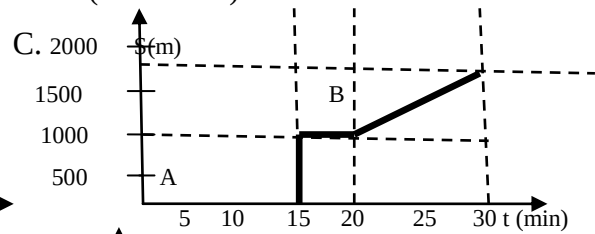
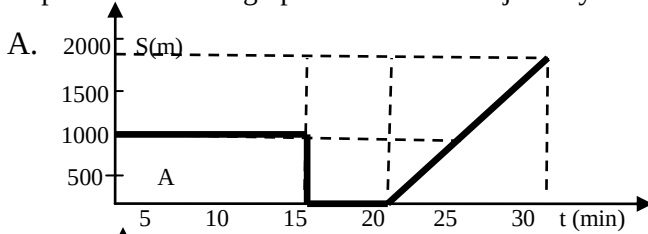
27. Which one of the following statements is correct? (UEE: 2007)
- A. An object moving toward the east cannot have acceleration toward the west.
- B. If the average velocities of an object are zero in some time interval, the average speed of the object for that time interval is also zero.
- C. The velocity- time graph of an object moving with constant acceleration is parallel to the time axis.
- D. An object having zero velocity can have acceleration different from zero.
28. A car travels along a straight line at a constant speed of 20 m/s for a distance d and then another d in the same direction at a constant speed of 36 km/hr. What is the average speed for the entire trip? (UEE: 2007)
- A. 23 km/hr. B. 48 km/hr. C. 54 km/hr. D. 60 km/hr.
29. A highway curve is banked (inclined) in such a way that a car travelling at speed of 13.5 m/s can round the curve without skidding in the absence of friction. If the angle is 30° , what is the radius of the curve? (UEE: 2007).
- A. 10.5 m. B. 21.0 m. C. 31.7 m. D. 36.7 m.

30. The graph below illustrates the position and time for a cat that runs to catch a rat and then returns with it. The cat caught the rat after 2 seconds. What was the cat's average speed as it returned with the rat? (UEE:2008)



- A. Its average return speed was 2 m/s. C. Its average returns speed was 0.7 m/s.
 B. Its average return speed was 2 m/s. D. Its average return speed was 0.9 m/s.
31. An airplane flies at speed of 720 km/hr at 37° North of West direction. How far does the plane travel to the west in 1 hour? (UEE:2008)
- A. 432 km. B. 720 km. C. 560 km. D. 504 km.
32. An airplane travelled from Addis Ababa to Mekele, 780 km, in 45 minutes. What was its average speed? (UEE:2008)
- A. 0.28 m/s. B. 1040 km/hr. C. 17.3 m/min. D. 585 km/hr.
33. An example of a body moving with constant speed but still accelerating is:
- A. A body moving on a straight road. C. A body moving in a circular path.
 B. A body moving on a straight rail way track. D. A body falling in a viscous fluid.
34. A student moves along the boundary of a square field of side 10 m in 40 sec. If he started from one of the corners of the square what will be the magnitude of displacement of the student at the end of 2 minutes and 20 seconds from his initial position?(UEE:2008)
- A. 10 m. B. $10\sqrt{2}$ m. C. 40 m. D. 30 m.
35. A cricketer throws a ball vertically upwards with initial speed of 20 m/s. How long is it in the air before it returns to the cricketer's hands? (UEE: 2009).
- A. 2 s. B. 10 s C. 1.5 s. D. 4 s.

36. Abeba walks to school. She walks 1 km in 15 minutes. She meets her friends Makeda—they talk for 5 minutes and then carry on walking to school. They walk 800 m in 10 minutes. Which of the following displacement–time graph shows Abeba’s journey to school? (UEE: 2009).



37. The graph of cannon-ball fired horizontally from a laboratory table is equal to $\frac{8}{3}$ times the height of the table. What is the direction of velocity vector of the projectile as it strikes the ground? (UEE: 2009).

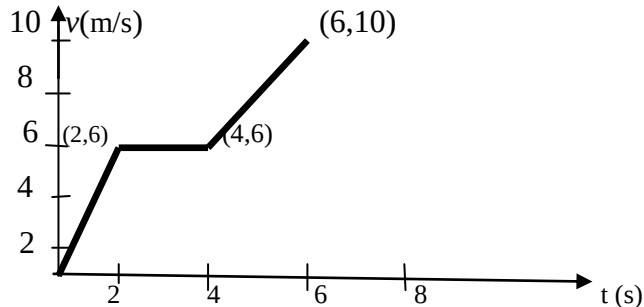
- A. 45^0 from the horizontal.
B. 53^0 from the horizontal.
C. 60^0 from the horizontal.
D. 37^0 from the horizontal.

38. A race car moving at a constant speed of 35 m/s. a security car was moving at a speed of 5 m/s as the race car passes by it and was accelerating at constant rate of 5 m/s². what was the speed of the security car when it took over the race car?(UEE:2010)

- A. 35 m/s. B. 60 m/s. C. 65 m/s. D. 5 m/s.

39. A car start moving from rest and its motion on a straight line is shown in the figure below what is the average velocity of the car with in the first 6 second.(UEE:2010)

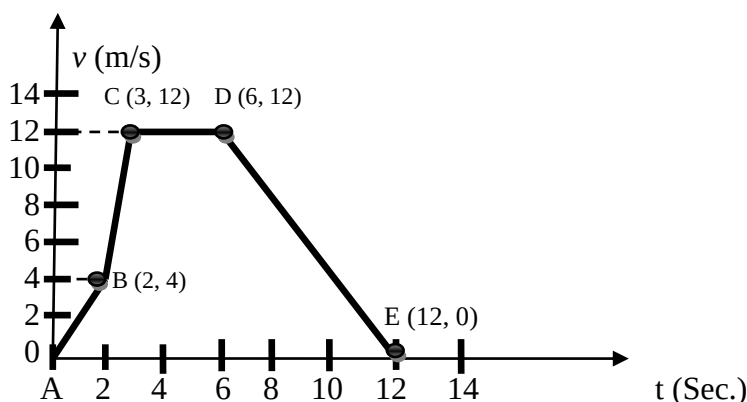
- A. 1.67 m/s.
B. 5.67 m/s.
C. 5 m/s.(2,6)
D. 6 m/s.



40. Which one of the following statement is correct regarding the motion in a plane (UEE:2010)

- A. When a body moves in a horizontal circle, its velocity is constant.
- B. When a body moves in a vertical circle, its speed is constant.
- C. In projectile motion the horizontal component of the motion is uniformly accelerated
- D. The centripetal force for a body moving in either vertical or horizontal circle is toward the center.

41. A bullet is fired at an angle of 30° above the horizontal. If air resistance is neglected, what should be the bullet's horizontal acceleration (a_x) and vertical acceleration (a_y) when it reaches its maximum height? (UEE:2010)
- A. Both $\vec{a}_x$ and $\vec{a}_y$ are zero. C. $\vec{a}_x$ is 10 m/s^2 downward and $\vec{a}_y$ is zero.
B. $\vec{a}_x$ is zero and $\vec{a}_y$ is 10 m/s^2 downward. D. Both $\vec{a}_x$ and $\vec{a}_y$ are 10 m/s^2 , downward.
42. A driver of an automobile travelling at a constant speed of 20 m/s suddenly applies a brake and the automobile comes to rest in 2 seconds after skidding for a certain distance. What is the length of the skid distance? (UEE: 2011).
- A. 400 m. B. 10 m. C. 40 m. D. 20 m.
43. Which of the following is correct about the motion shown in the velocity-time graph below? (UEE: 2011)



- A. Between C and D, the motion is with constant acceleration.
B. Between B and C, the acceleration 4 m/s^2 .
C. Between D and E, the motion is with constant positive acceleration.
D. Total displacement is 84 m.
44. An object of mass M is set in a vertical circular motion. The tension T from the rope keeps the object in a circular path with speed v . Where does the rope experience a maximum tension? (UEE: 2011).
- A. At the top of the circle. C. When the object is at half of the circle.
B. At the bottom of the circle. D. When it is at 45° to the vertical line.
45. A shell is fired from a gun, whose barrel is inclined at an angle to the horizontal during the flight; the shell explodes in air into fragments. The center of mass of different fragments will follow: (UEE: 2011).
- A. A horizontal straight line. C. A parabola.
B. A vertical straight line. D. An unpredictable path.
46. A 5 kg mass pushed upward along an inclined plane of inclination 30° with constant force F . If the acceleration of the block for this motion is 1 m/s^2 and the plane is assumed to be frictionless, what is the magnitude of the constant force F ? (UEE: 2011)
- A. 5 N. B. 25 N. C. 20 N. D. 30 N.

THE END