```
Q1 Q0 An empty fuel tank of a car needs 50 liters of gasoline
   Q0 to fill up. Find the volume of the fuel tank in m**3.
   Q0 (1 milliliter = 1 cm**3)
   Q0
   A1   0.050
   A2   50 000
   A3   50
   A4   500
   A5   0.50
   Q0
Q2 Q0 Fig. 1  shows a graph of position versus time for a particle
   Q0 moving along the x axis. What is the total distance travelled
   Q0 by the particle in 15 s?
   Q0
   A1 12.5 m
   A2 7.5  m
   A3 10   m
   A4 5.0  m
   A5 22.5 m
   Q0
Q3 Q0 An object starts from rest at the origin and moves along the
   Q0 x-axis with a constant acceleration of 5.0 m/s**2.  Find its
   Q0 average velocity as it goes from x = 0 m to x = 10 m.
   Q0
   A1 5.0 m/s
   A2 10  m/s
   A3 17  m/s
   A4 3.0 m/s
   A5 8.0 m/s
   Q0
Q4.Q0 Starting at time t = 0, an object moves along a straight line
   Q0 with a velocity in m/s    given by     v = 72 - 2 t**2,
   Q0 where t is in seconds. Find its acceleration when it stops
   Q0 momentarily.
   Q0
   A1 -24  m/s**2
   A2 0
   A3 -4.0 m/s**2
   A4 -9.8 m/s**2
   A5 -4.9 m/s**2
   Q0
Q5 Q0 A stone is thrown vertically upward with an initial speed of
   Q0 15 m/s. What is its speed at a height of 10 m from its release
   Q0 point?
   Q0
   A1 5.4 m/s
   A2 0
   A3 It will not reach the height of 10 m.
   A4 9.8 m/s
   A5 12  m/s
   Q0
Q6 Q0 The angle between the two vectors A = 2 i  + 4 j and
   Q0 B = 4 i - 2 j   is:
   Q0
   A1   90  degrees
   A2   27  degrees
   A3   39  degrees
   A4   180 degrees
   A5   0   degrees
   Q0
Q7 Q0 As shown in Fig. 3, a block moves down on a 45-degree inclined
   Q0 plane of 2.5 m length, then horizontally for another 2.5 m, and
   Q0 then falls down vertically a height of 2.5 m. Find the magnitude
   Q0 and direction of the resultant displacement vector of the block.
   Q0
   A1  6.0 m and 45 degrees below horizontal axis
   A2  3.5 m and 30 degrees below horizontal axis
   A3  6.0 m and 30 degrees below horizontal axis
```

A4 3.5 m and 45 degrees below horizontal axis
A5 5.5 m and 60 degrees below horizontal axis
Q0
Q8 Q0 Given the vectors A = 3 j + 6 k , B = 15 i + 21 k. Find the
Q0 magnitude of vector C that satisfies equation 2A + 3C - B = 0.
Q0
A1 6.16
A2 5.48
A3 18.5
A4 6.71
A5 8.60
Q0
9 Q0 At t=0, a particle moving in the xy plane with a constant
Q0 acceleration of a=(2i + 4j) m/s**2 has a velocity Vo=(-4j) m/s
Q0 at the origin. Find the speed of the particle at t=3 s.
Q0
A1 10 m/s
A2 0
A3 4   m/s
A4 24 m/s
A5 20 m/s
Q0
10 Q0 A ball is projected from the ground into the air with velocity
Q0 Vo. At a height of 10.0 m the velocity is observed to be
Q0 V = 8.5 i + 9.1 j in m/s. Find Vo.
Q0
A1 (8.5 i + 16.7 j) m/s
A2 (16.7 i + 9.1 j) m/s
A3 (8.5 i + 9.1 j)   m/s
A4 (2.5 i + 3.1 j)   m/s
A5 (6.2 i + 1.1 j)   m/s
Q0
11 Q0 Rain is falling vertically at constant speed of 6.0 m/s.
Q0 At what angle from the vertical do the rain appear to be falling
Q0 as viewed by the driver of a car traveling on a straight, level
Q0 road with a speed of 8.0 m/s?
Q0
A1 53 degrees
A2 37 degrees
A3 49 degrees
A4 41 degrees
A5 0 degree
Q0
12 Q0 The speed of a particle moving in uniform circular motion is
Q0 doubled while the radius of the path of the particle is
Q0 increased by a factor of 4. The new centripetal force needed
Q0 will be :
Q0
A1 the same as before
A2 half as great as before
A3 twice as great as before
A4 1/4 of its original value
A5 four times as great as before
Q0
13 Q0 A ball is thrown horizontally with speed Vo from the edge of
Q0 a cliff 35 m high. The ball strikes the ground at a point 80 m
Q0 from the base of the cliff. Find Vo.
Q0
A1 30   m/s
A2 9.8 m/s
A3 2.5 m/s
A4 22   m/s
A5 45   m/s
Q0
14 Q0 As shown in Fig. 7, a 25-kg box is pushed across a frictionless
Q0 horizontal floor with a force of 20 N, directed at an angle of
Q0 20 degrees below the horizontal. The magnitude of the
Q0 acceleration of the box is:

```
    Q0
    A1 0.75 m/s**2
    A2 0.27 m/s**2
    A3 17   m/s**2
    A4 21   m/s**2
    A5 0.82 m/s**2
    Q0
 15 Q0 An object of mass M = 10 kg moving on frictionless horizontal
    Q0 surface is subjected to two applied forces as shown in Fig. 2.
    Q0 In which situation is the object accelerating to the right?
    Q0
    A1  (d)
    A2  (a)
    A3  (c)
    A4  (b)
    A5  (e)
    Q0
 16 Q0 Two blocks A (MA = 4 kg)and B (MB = 20 kg) are in contact with
    Q0 each other and are placed on a horizontal frictionless surface.
    Q0 A 36-N constant force is applied to A as shown in Fig. 4. The
    Q0 magnitude of the force exerted on A by B is
    Q0
    A1 30  N
    A2 0   N
    A3 36  N
    A4 15  N
    A5 3.6 N
    Q0
 17 Q0 Two masses m1 = 2kg, m2 = 4 kg are connected by a light string
    Q0 that passes over a frictionless and massless pulley (see Fig. 5).
    Q0 Find the magnitude of the acceleration of the masses.
    Q0
    A1 3.27 m/s**2
    A2 2.15 m/s**2
    A3 10.5 m/s**2
    A4 0.75 m/s**2
    A5 1.23 m/s**2
    Q0
 18 Q0 A stone, of mass m, is attached to a strong string and rotates
    Q0 in a vertical circle of radius R. At the bottom of the path the
    Q0 tension in the string is 3 times the weight of the stone. The
    Q0 speed of the stone at this point is given by .
    Q0
    A1 Sqrt(2gR).
    A2 2*Sqrt(gR)
    A3 2*gR
    A4 Sqrt(3gR)
    A5 Sqrt(gR/2)
    Q0
 19 Q0 A block attached to a string, rotates counter-clockwise in a
    Q0 circle on a smooth horizontal surface. The string breaks at
    Q0 point P (Fig. 6). What path will the block follow?
    Q0
    A1 path B
    A2 path A
    A3 path C
    A4 path D
    A5 path E
    Q0
 20 Q0 A box slides down a 30 degree incline with an acceleration =
    Q0 3.2 m/s**2. Find the coefficient of kinetic friction between
    Q0 the box and the incline.
    Q0
    A1 0.20
    A2 0.25
    A3 0.15
    A4 0.30
    A5 0.62
```

PHYS101 - FIRST MAJOR EXAM – FIGURES
Term-031

FIGURE-1

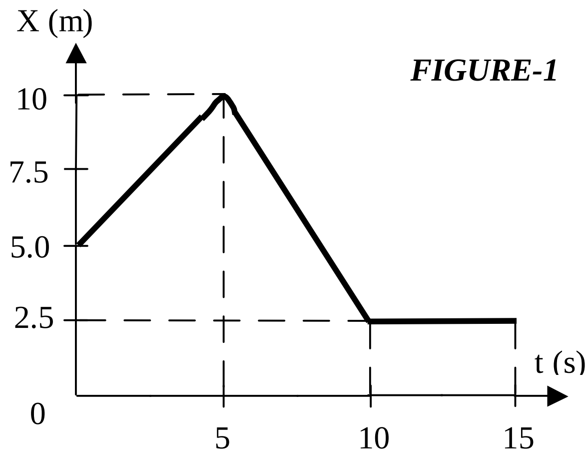

FIGURE-3

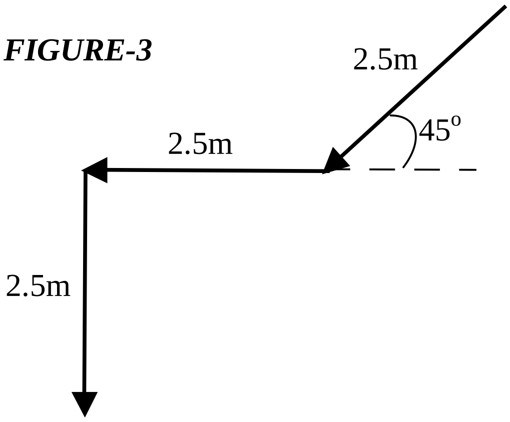

FIGURE-2

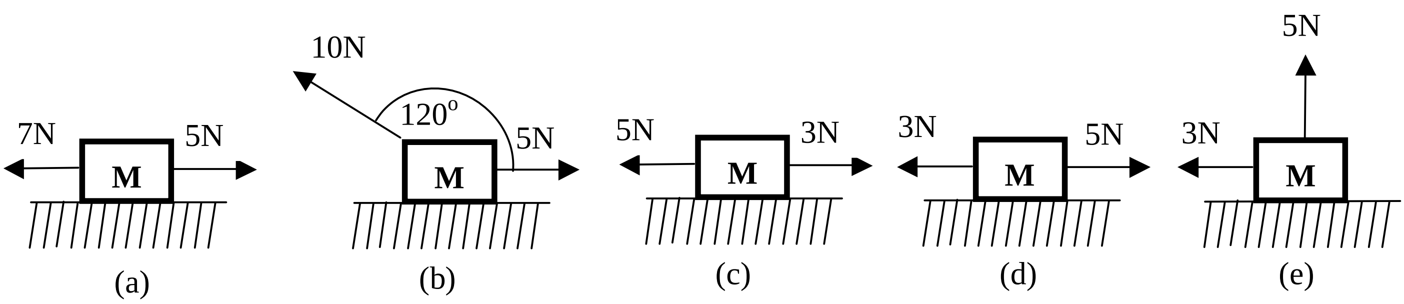

FIGURE-4

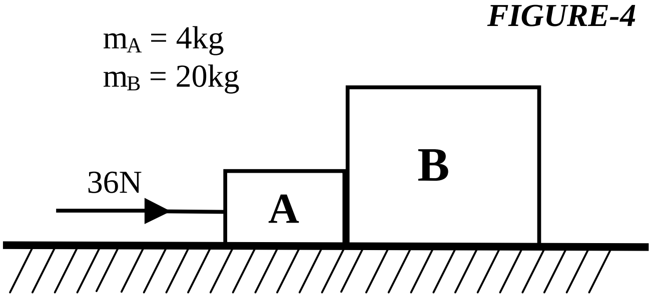

FIGURE-5

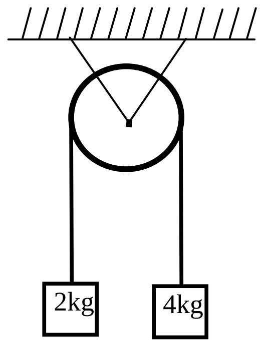

FIGURE-6

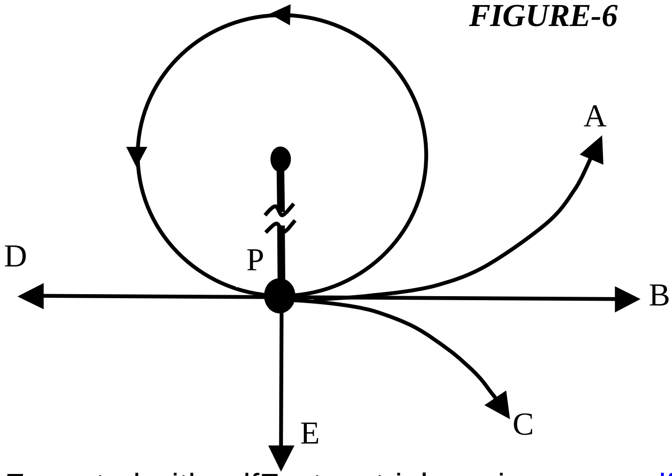

FIGURE-7