First major exam term 992

Q1 Q0 A cube of copper has a mass m = 126 g. Find the number
ch Q0 of copper atoms in this cube.
1. Q0 Atomic mass of copper = 63.0 g/mole
Q0 Avogadro number = 6.02 * 10**23 atoms/mole
Q0
A1 1.20 * 10**24
A2 6.02 * 10**23
A3 3.01 * 10**23
A4 2.80 * 10**24
A5 5.68 * 10**24
Q0
Q2 Q0 Pressure, P, is a physical quantity defined as:
ch Q0 P = F / A
1. Q0 where F is force, and A is the area of the surface
Q0 on which F is applied. Find the dimensions of P.
Q0
A1 M/(L*T**2)
A2 M*L/T**2
A3 M*T**2/L
A4 M*L/T
A5 L/T**2
Q0
Q3 Q0 A car starts a trip from Dammam, goes 480 km in
ch Q0 a straight line to Riyadh in 4.0 hours. Immediately,
2. Q0 the car is turned around, and returns to Dammam
Q0 in 6.0 hours. Find the average speed of the car for
Q0 the whole trip.
Q0
A1 96 km/h
A2 50 km/h
A3 120 km/h
A4 0 km/h
A5 480 km/h
Q0
Q4 Q0 An object is released from rest at a height H.
ch Q0 It takes 2.00 s for the object to fall from point A
2. Q0 to point B (see Figure 1). What is the initial
Q0 height H?
Q0
A1 385 m
A2 463 m
A3 260 m
A4 320 m
A5 140 m
Q0
Q5 Q0 Figure 2 represents the straight line motion of
ch Q0 a car. What is the distance traveled by the car
2. Q0 from t = 0 to t = 5 h? (h stands for hours)
Q0
A1 480 km
A2 120 km
A3 0 km
A4 840 km
A5 360 km
Q0
Q6 Q0 Starting from the origin, a boy walks 3.5 m

```
ch Q0 South, then  10 m at 30 degrees North of East,
3. Q0 and finally  10 m West. Find the resultant
   Q0 displacement vector. Take East along the positive
   Q0 x-axis and North along the positive y-axis.
   Q0
   A1 (-1.34 i - 1.5 j)   m
   A2 (10    i + 2.6 j)   m
   A3 (8.6   i - 5.1 j)   m
   A4 (5.1   i + 6.2 j)   m
   A5 (10    i)           m
   Q0
Q7 Q0 Which of the following statements is CORRECT?
ch Q0
3. A1 The magnitude of a vector cannot be negative.
   A2 The magnitude of a particle displacement can be
   A2       greater than the distance traveled.
   A3 It is possible to add a vector quantity to a
   A3       scalar quantity.
   A4 When the result of adding two vectors gives zero,
   A4       then these vectors have different magnitudes.
   A5 An object moved once around a given circle has
   A5       a non-zero displacement.
   Q0
Q8 Q0 A particle leaves the origin at t=0 with a velocity
ch Q0 V0 = (8.0 i) m/s. The constant acceleration of the
4. Q0 particle is  a = ( -2.0 i + 3.0 j) m/s**2. Find the
   Q0 y-coordinate of the particle when it reaches its
   Q0 maximum positive x-coordinate.
   Q0
   A1 16 m
   A2 14 m
   A3 24 m
   A4 34 m
   A5 10 m
   Q0
Q9 Q0 A stone is thrown horizontally from the top of
ch Q0 a building, of height 75 m, with an initial speed of
4. Q0 15 m/s. Find the speed of the stone 2.0 s after it
   Q0 is thrown.
   Q0
   A1 25 m/s
   A2 10 m/s
   A3 15 m/s
   A4 38 m/s
   A5 0  m/s
   Q0
Q10Q0 A particle rotates in a horizontal circle of radius
ch Q0 3.5 m. At a given instant, its total acceleration is
4. Q0 2.1 m/s**2 in a direction that makes an angle of 60
   Q0 deg to the radial direction (see Figure 3). Determine
   Q0  the speed of the particle, v, at this instant.
   Q0
   A1 1.9   m/s
   A2 2.5   m/s
   A3 4.2   m/s
   A4 9.8   m/s
   A5 7.4   m/s
   Q0
```

Q11Q0 Two roads intersect as shown in Figure 4. At this
ch Q0 instant, a police car (P) is approacing the
4. Q0 intersection along the x-axis at 80 km/h while a
Q0 truck (T) is moving along the y-axis at 60 km/h.
Q0 What is the velocity of the police car relative to
Q0 truck?
Q0
A1 (80 i - 60 j) km/h
A2 (80 j) km/h
A3 (60 i + 80 j) km/h
A4 (60 j) km/h
A5 (80 i) km/h
Q0
Q12Q0 An ice-boat sails across the surface of a frozen
ch Q0 lake with constant acceleration produced by the
4. Q0 wind. At a given instant, the velocity of the boat
Q0 is v = (6.3 i -8.4 j) m/s. Three seconds later,
Q0 because of change of wind direction, the boat comes
Q0 instantaneously to rest. Find the average
Q0 acceleration of the boat during this 3.0 s interval.
Q0
A1 (-2.1 i + 2.8 j) m/s**2
A2 (2.1 i - 2.8 j) m/s**2
A3 (2.8 j) m/s**2
A4 (-2.8 j) m/s**2
A5 0 m/s**2
Q0
Q13Q0 A block of mass m = 4.0 kg is pushed up a smooth
ch Q0 30 deg inclined plane, by a constant force of
5. Q0 magnitude 40 N and parallel to the incline. Find
Q0 the magnitude of the acceleration of the block.
Q0
A1 5.1 m/s**2
A2 9.8 m/s**2
A3 1.2 m/s**2
A4 7.3 m/s**2
A5 0. m/s**2
Q0
Q14Q0 In the system shown in Figure 5, a horizontal force
ch Q0 (F) acts on M1(=2.0 kg). If the acceleration of the
5. Q0 system has a value of a = 3.5 m/s**2, find the value
Q0 of (F). (Ignore force of friction)
Q0
A1 60.2 N
A2 12.7 N
A3 0.0 N
A4 38.2 N
A5 9.8 N
Q0
Q15Q0 Two blocks of masses M1 = 2.0 kg and M2 = 4.0 kg
ch Q0 are in contact with each other and move on a frictionless
5. Q0 horizontal surface under the action of a horizontal
Q0 force F = 60 N (see Figure 6). Find the magnitude of
Q0 the force that M1 exerts on M2.
Q0
A1 40 N
A2 10 N
A3 9.8 N

A4 0 N
A5 60 N
Q0
Q16Q0 Acceleration is always in the direction:
ch Q0
5. A1 of the net force.
A2 of the displacement.
A3 of the initial velocity.
A4 of the final velocity.
A5 opposite to the frictional force.
Q0
Q17Q0 A ball of mass 100 g is connected to a string that
ch Q0 can withstand a maximum tension of 50 N before it
6. Q0 breaks. The ball rotates in a circle of radius 20 cm
Q0 on a horizontal frictionless plane. The maximum speed
Q0 the ball can have before the string breaks is:
Q0
A1 10 m/s
A2 20 m/s
A3 15 m/s
A4 18 m/s
A5 35 m/s
Q0
Q18Q0 A racing car, moving on a horizontal circular track
Q0 of radius 500 m, accelerates at a uniform rate from
ch Q0 0.0 m/s to a speed of 35 m/s in 11 s. Find the magnitude
6. Q0 of the total acceleration of the car when its speed
Q0 is 30 m/s.
Q0
A1 3.7 m/s**2
A2 3.2 m/s**2
A3 1.8 m/s**2
A4 2.0 m/s**2
A5 4.4 m/s**2
Q0
Q19Q0 A car is traveling at 80 km/h on a horizontal
ch Q0 highway. If the coefficient of kinetic friction
5. Q0 between the road and tires is 0.1, what is the
Q0 minimum distance in which the car will stop
Q0 after applying the brakes?
Q0
A1 252 m
A2 161 m
A3 103 m
A4 415 m
A5 0 m
Q0
Q20Q0 An object is moving in a circle at constant speed.
ch Q0 Which of the following statements is CORRECT?
4. Q0
A1 It has an acceleration of constant magnitude.
A2 It must have only one force acting on it.
A3 It is not accelerating.
A4 It must have a constant velocity.
A5 It has an acceleration that is tangent to the circle.

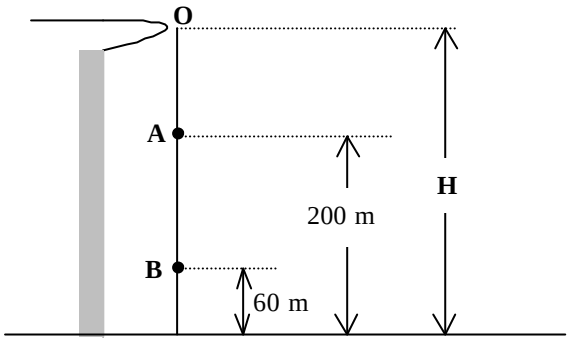

Figure 1

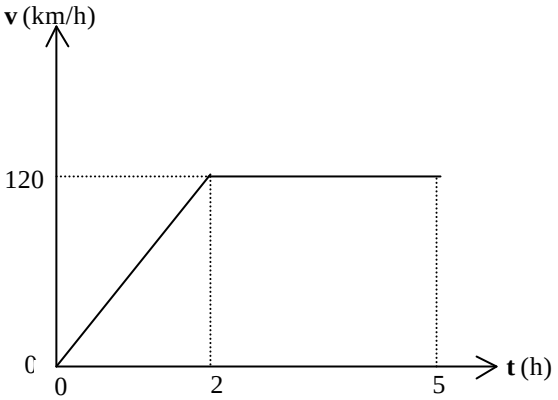

Figure 2

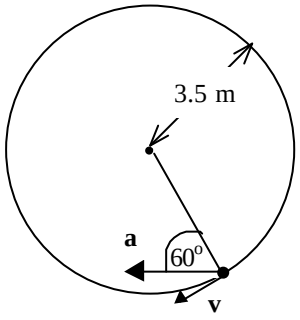

Figure 3

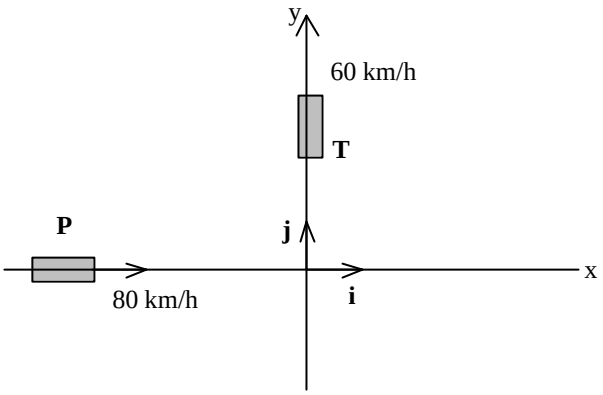

Figure 4

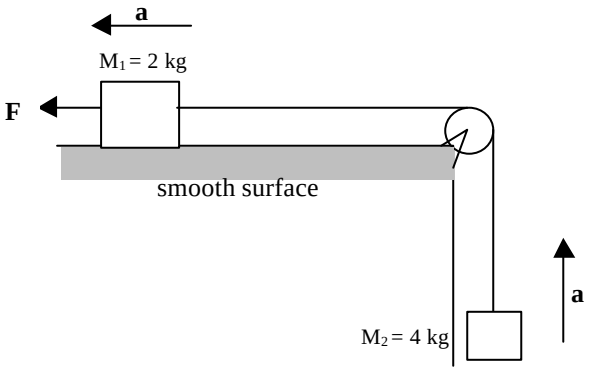

Figure 5

Figure 6