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Part I	Part II		Total
() ' 4=	Q1	Q2	

PART I: Choose the correct answer

15 ' 4=60 pts

1) The unit of Newton is equivalent to

- a) dyne b) $\text{kg.m}^2/\text{s}$ c) kg.m/s d) kg.m/s^2

2) $k \times j$ is equal to

- a) 1 b) 0 c) i d) $-i$

3) The value of $i \cdot (k \times j)$

- a) 1 b) -1 c) $\sqrt{3}$ d) 0

4) You are given $\mathbf{A} = \mathbf{i} + 2\mathbf{k}$, and $\mathbf{B} = 3\mathbf{i} - 2\mathbf{j}$. The dot product $\mathbf{A} \cdot \mathbf{B}$ is

- a) -1 b) 3 c) $3\mathbf{i} - 2\mathbf{j} + 2\mathbf{k}$ d) $3\mathbf{i}$

5) A particle travels 6 m east within 3 s and then 4 m west for 2 s. The average speed of the particle during the 5 s period is

- a) 0.4 m/s b) 2.0 m/s c) 0 d) 4.0 m/s

6) Referring to the previous problem, the average velocity of the particle during the 5 s period is

- a) 0.4 m/s b) 2.0 m/s c) 0 d) 4.0 m/s

7) The position of a particle is given by $x = 3t^2 + 4$, with x in (m) and t in (s). The instantaneous velocity of the particle at $t=2$ s is

- a) 12 m/s b) 16 m/s c) 16 m/s d) 10 m/s

8) Referring to the previous problem, the average acceleration of the particle between $t=0$ and $t=1$ s is

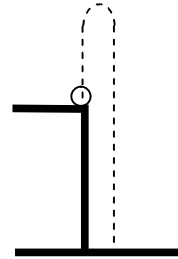
- a) 12 m/s^2 b) 3 m/s^2 c) 7 m/s^2 d) 6 m/s^2

9) A car, initially at rest, travels 20 m in 4 s with constant acceleration. The acceleration of the car is

- a) 0.4 m/s^2 b) 1.3 m/s^2 c) 2.5 m/s^2 d) 4.9 m/s^2

10) A ball is thrown vertically upward with initial speed of 6 m/s. It hits the ground with a speed of 12 m/s. The time of flight of the ball is

- a) 1.8 s b) 0.6 s c) 2.4 s d) 1.2 s



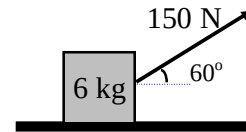
11) For a projectile motion, the acceleration of the ball at its highest point is

- a) 9.8 m/s^2 down b) 9.8 m/s^2 up c) zero d) depends on the initial velocity

12) A 6-kg object is moving south. The net force acting on the object is 12 N north. The acceleration of the object is

- a) 2 m/s^2 north b) 2 m/s^2 south c) 18 m/s^2 north d) 18 m/s^2 south

13) A block of mass $m=6 \text{ kg}$ rests on a smooth horizontal surface. It is pulled to the right by a force of 120 N that makes an angle of 60° with the horizontal, as shown. The force exerted by the surface on the block is



- a) 58.8 N b) 0 c) 16.2 N d) -16.2 N

14) A block of mass $m=8 \text{ kg}$ rests on a rough horizontal surface with $m_s = 0.6$ and $m_k = 0.4$. It is pulled to the right by a force of 40 N as shown. The force of friction on the block by the surface is



- a) 47 N b) 31.4 N c) 40 N d) 0

15) Referring to the previous problem, the acceleration of the block is

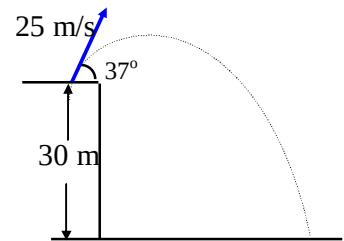
- a) 5.0 m/s^2 b) 1.1 m/s^2 c) 0.9 m/s^2 d) 0

PART II: Solve the following problems

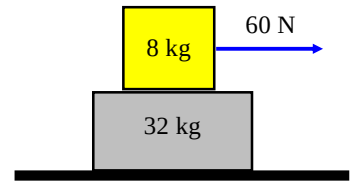
4 ´ 10=40 pts

Q1) A bird is traveling vertically upward at a constant speed of 12 m/s with a piece of bread in his mouth. When it is 88 m above the ground the bread piece is released from the bird's mouth. How long does the bread take to reach the ground?

Q2) A particle is thrown from the top of a building 30 m in height with initial speed of 25 m/s that makes an angle of 37° above the horizontal. Find the velocity of the projectile just before hitting the ground.



Q3) A 8-kg block is placed in top of another block of 32 kg., which in turn rests on a horizontal, frictionless surface as shown in Figure 4.22. The coefficient of static friction between the blocks is $\mu_s = 0.6$, whereas the kinetic coefficient is $\mu_k = 0.4$. A horizontal force of 60 N is applied to the 8-kg block. Calculate the acceleration of the 8-kg block.



Q4) Referring to the previous problem, find the acceleration of the 32-kg block.