

اسم المدرس:.....

الرقم الجامعي:.....

اسم الطالب:.....

Part I	Part II		Total
() × 4=	Q1	Q2	

PART I: choose the correct answer

15×4=60 pts

1) A resistive force is proportional to the velocity as $F = -bv$. The unit of the constant b is

- a) Newton b) kg./s c) kg.m/s d) kg.m/s²

2) Which of the following quantities is a scalar

- a) speed b) acceleration c) displacement d) force

3) The value of $\mathbf{i} \cdot (\mathbf{k} \times \mathbf{i})$

- 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 3 m east within 2 s and then 4 m north for 1 s. The average speed of the particle during the 3 s period is

- a) 1.7 m/s b) 2.3 m/s c) 1.6 m/s d) $(\mathbf{i} + 1.3\mathbf{j})$ m/s

6) Referring to the previous problem, the average velocity of the particle during the 3 s period is

- a) 1.7 m/s b) 2.3 m/s c) 1.6 m/s d) $(\mathbf{i} + 1.3\mathbf{j})$ 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

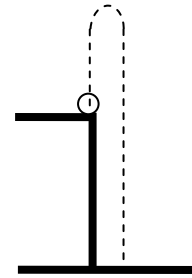
- a) 16 m/s b) 12 m/s c) 16 m/s d) 10 m/s

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

- a) 12 m/s² b) 3 m/s² c) 7 m/s² d) 6 m/s²

9) 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



10) A boat travels with a speed of 14 m/s north with respect to the water. If the water flows east with a speed of 6 m/s, the speed of the boat relative to the earth is

- a) 15 m/s b) 20 m/s c) 8 m/s d) 16 m/s

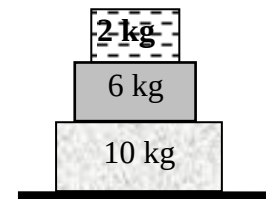
11) For a projectile motion, the acceleration of the ball at its highest point is

- 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) Three blocks rest on a table as shown in the figure. The force of the 10-kg block on the 6-kg block is

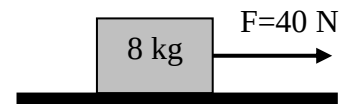


- a) 78.4 N b) 58.8 N c) 19.6 N d) 98 N

14) Referring to the previous problem, the force of the 2-kg block on the 10-kg block is

- a) 78.4 N b) 58.8 N c) 19.6 N d) 0

15) A block of mass $m=8 \text{ kg}$ rests on a rough horizontal surface with. $\mu_s = 0.6$ and $\mu_k = 0.4$. 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

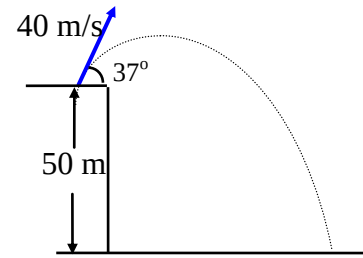


- a) 47 N b) 31.4 N c) 40 N d) 0

PART II: Solve the following problems**2×20=40 pts**

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.

- a) Find the horizontal range of the projectile.
- b) Find the velocity of the projectile just before hitting the ground.



Q2) Two blocks $m_1=2$ kg and $m_2=4$ kg, attached by a string, are dragged along a smooth surface by a force $\mathbf{F}=60$ N, as shown in the figure.

- a) Find the acceleration of the two blocks
- b) Find the tension between the two blocks.

