Prince Sultan University

Department of Mathematics & Physics

PHY 105- General Physics

Second Exam

Second Semester, Term 112

Wednesday 2/5/2012

Examination Time : 60 minutes

Name (Please Print)_____ Student I.D. _____
Section # _____

Important Instructions:

1. You can use a scientific calculator that does not have programming or graphing capabilities.
*2. You may **NOT** borrow a **calculator** from anyone.*
*3. Do not use **RED pen**.*
*4. This is a closed books and notes exam. Do **NOT** use notes or textbooks.*
*5. There should be **NO** talking during the examination.*
*6. Your will be **expelled** immediately from the exam if your mobile phone is seen or heard.*
*7. Any signs of **cheating** may cause you being expelled from the exam.*
*8. This examination has **2 parts**. **Part 1** has **11multiple choice** questions, each question worth **1 point**. **Part 2** has **Two** workout problems each problem worth **3 points.***

Make sure your paper has all the questions and problems.

	Possible Score	**Student's Score**	**Student's Total Score**
Part 1 Questions	**11**	**1 x**	
Part 2: P. # 1	**3**		
P. # 2	**3**		
Total	**17**		**/15**

Part 1: 11 Multiple Choice Questions (1 mark each)

Use g=10 m/s^2

Please read each question carefully then please circle ○ the correct answer.

1) Mass and weight

a) both measure the same thing. b) are exactly equal.

c) are two different quantities. d) are both measured in kilograms.

e) are both measured in Newton.

2) A constant net force acts on an object. Describe the motion of the object.

a) constant acceleration b) constant speed c) constant velocity
d) increasing acceleration e) decreasing acceleration

3) In the absence of external forces, a moving object will
a) stop immediately. b) slow down and eventually come to a stop.
c) move faster and faster. d) move with constant velocity.
e) move with constant velocity for a while and then slow to a stop.

4) A golf club hits a golf ball with a force of 2400 N. The golf ball hits the club with a force
a) slightly less than 2400 N. b) exactly 2400 N. c) close to 0 N.
d) slightly more than 2400 N. e) anything can happen.

5) An object is hanging by a string from the ceiling of an elevator. The elevator is moving up at constant speed. What is the tension in the string?
a) zero
b) less than the weight of the object
c) exactly equals the weight of the object
d) greater than the weight of the object
e) cannot be determined without knowing the speed of the elevator

6) A ***50 kg*** box is being pulled along a horizontal frictionless surface. The pulling force is ***10 N*** and is directed ***20°*** above the horizontal. What is the acceleration of the crate?
a) 0.0684 m/s^2 b) 0.188 m/s^2 c) 0.200 m/s^2 d) 0.376 m/s^2 e) 0.0728 m/s^2

7) A block of mass m slides down a frictionless plane inclined at an angle θ with the horizontal. The normal force exerted by the plane on the block is

a) mg.

b) $mg\sin\theta$.

c) $mg\cos\theta$.

d) $mg\theta$.

e) zero, since the plane is frictionless.

8) Two forces $F_1 = 35\hat{x} + 17\hat{y}\ \ N$ and $F_2 = -3\hat{x} + 7\hat{y}\ \ N$ are acting on a 4 kg object, what is the resulting acceleration of the block?

a) $a = 4\hat{x} + 8\hat{y}\ \ m/s^2$.

b) $a = 8\hat{x} + 4\hat{y}\ \ m/s^2$.

c) $a = 6\hat{x} + 8\hat{y}\ \ m/s^2$.

d) $a = 8\hat{x} + 6\hat{y}\ \ m/s^2$.

e) $a = 32\hat{x} + 24\hat{y}\ \ m/s^2$.

9) A 0.2 kg stone is attached to the end of a 12 cm long string and is rotated in a vertical circle. If the speed of the stone at the bottom point is 6 m/s^2, What is the tension in the string at this point?

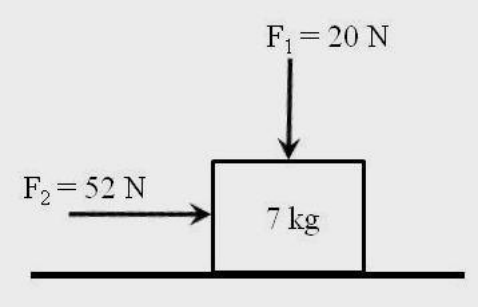
a) 58 N b) 62 N c) 60 N d) 2.6 N e) 1.4 N

10) A car travelling at 15 m/s rounds a curve so that its centripetal acceleration is 3 m/s^2. What is the radius of the curve?

a) 3 m b) 5 m c) 675 m d) 45 m e) 75 m

11) A 7 kg box is initially at rest on a rough horizontal surface. The coefficients of static and kinetic friction between the box and the surface are 0.6 and 0.4 respectively. If two forces are applied on the box as shown, what will be the friction force acting on the box?

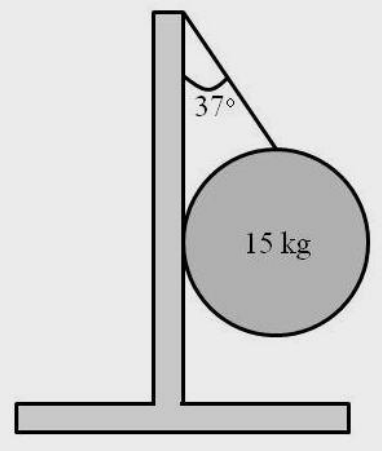
a) 52 N.
b) 55 N.
c) 28 N.
d) 36 N.
e) 42 N.



Part 2: Solve the following two problems in the space provided in between showing all your steps (3 marks each)

Problem 1: A 15 kg ball leans against the pole it is attached to as shown. Find

a) The tension in the string.



b) The contact force between the ball and the pole

Problem 2: A 2 kg block is connected by means of a massless rope and frictionless pulley to an 8 kg block as shown in the figure. The coefficient of kinetic friction between the smaller block and the table is 0.5. If the system is released to move, calculate the acceleration of the system and the tension in the string.