PRINCE SULTAN UNIVERSITY
جامعة الأمير سلطان

Department of Mathematics and General Sciences

Physics 1 (PHY105)
Second Major Exam

First Semester, Term 131
Date: Thursday 05/12/2013

Name:	
ID number:	
Section number or time:	
Instructor's name:	

Important instructions:

1. Examination time: 60 minutes.
2. Write your name now before starting with the questions.
3. Switch off your mobile phone and put any books and notes away.
4. Check that you have 6 pages in total, including this cover page and a scratch paper.
5. You may use a calculator but you may *not* borrow one.

Good Luck!

	Mark
Part 1	
Part 2	
Total	

SCECTION I (8 Marks): Circle the letter of the correct answer. Use $g = 9.8\ m/s^2$

Q.1. Which one of the following is the basic unit of Energy in SI System?

A) J/s B) N/s^2 C) J D) N.s

Q.2. A 10 kg mass is pushed on a frictionless surface by a constant horizontal force of 20 N through a distance of 4 m starting from rest. The final velocity of mass is

A) 8 m/s B) 4 m/s C) 20 m/s D) 16 m/s

Q.3. The apparent weight of a 60 kg man in an elevator with a downward acceleration of 4.8 m/s^2 is,

A) 300N B) 588N C) 500N D) 876 N

Q.4. A mass of 100 kg slides down a frictionless incline plane inclined at an angle of 30^o. Its acceleration is,

A) 3.0 m/s^2. B) 4.9 m/s^2. C) 9.8 m/s^2. D) 8.49 m/s^2.

Q.5. A player stops a ball of mass 0.4 kg moving at 20 m/s. Work done by player is,

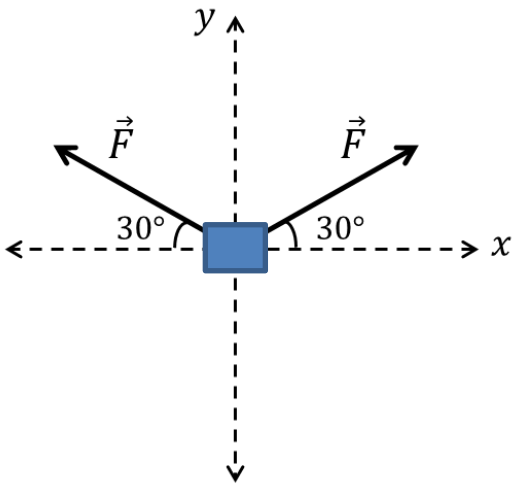
A) 320 J. B) 200 J. C) - 80 J. D) - 50 J

Q.6. A 1200 kg car can accelerate from rest to 90 km/h in 6 seconds. The power of its engine is,

A) 10^4 W B) 3.75 x 10^5 W C) 6.25 x 10^4 W D) None

Q.7. Two forces of 10 N each act on a 0.5 kg box as shown in the diagram. The acceleration of the box is: (2 marks)

A) (10 m/s^2) $\hat{y}$ B) (20 m/s^2) $\hat{y}$ C) (10 m/s^2) $\hat{x}$ D) (35 m/s^2) $\hat{x}$



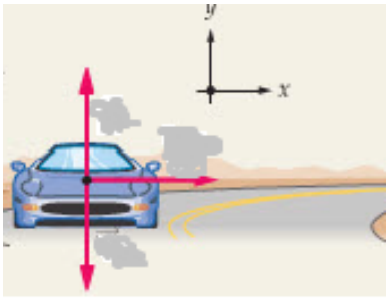
SCENTION II (12 marks): ANSWER COMPLETELY SHOWING ALL YOUR WORK.

use $g = 9.8\ m/s^2$.

Q1. (2 marks)

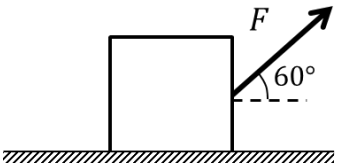
A 1500 kg car rounds a curve of radius 50 m. The coefficient of static friction between the road and car tires is 0.67.

(a) What is the greatest speed the car can turn the curve without skidding?



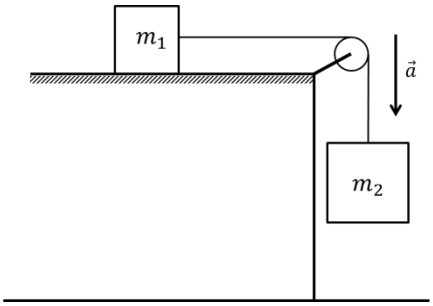
Q2. (2 marks)

A 5 kg box is pulled with a force of F = 10 N directed at 60^o above the horizontal. What is the normal force acting on the box?



Q3. (4 marks)

Two objects of masses m_1 = 4 kg and m_2 = 7 kg are connected by a light string that passes over a frictionless pulley as in the diagram. The coefficient of kinetic friction between mass m_1 and the table is 0.3.



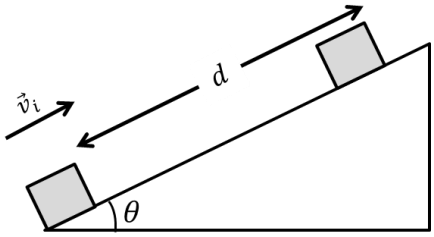
(a) Find acceleration of the two objects.

(b) What is the tension in the string?

Q.4 (4 marks)

A 0.5 kg box is given an initial speed of 3 m/s to slide up on a rough plane inclined at 30^o. The object slides a distance of d = 50 cm before stopping completely.

(a) What is the total work done on the box while moving up the inclined plane?



(b) Calculate the coefficient of kinetic friction

(c) What is the work done by the frictional force?

Scratch paper
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