Prince Sultan University

Deanship of Educational Services
Department of Mathematics
and General Sciences

COURSE DETAILS:

PHYSICS I	PHY105	MAJOR EXAM I
Semester:	Fall Semester --Term 181	
Date:	Monday, October 15, 2018	
Time Allowed:	60 minutes	

STUDENT DETAILS:

Student Name:	
Student ID Number:	
Section:	532, 535, 538, 541,
Instructor's Name:	Circle the name of your Instructor: Dr. Muaffaq Nofal, Dr. Hazem Abu-Farsakh, Dr. Asif zaidi

INSTRUCTIONS:

- You may use a scientific calculator that does not have programming or graphing capabilities. NO borrowing calculators.
- NO talking or looking around during the examination.
- NO mobile phones. If your mobile is seen or heard, your exam will be taken immediately.
- Show all your work and be organized.
- You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem.

GRADING:

	Page 1	Page 2	Page 3	Total
Questions				
Marks	**9**	**3**	**3**	**15**

Part 1: 9 Multiple Choice Questions (1 mark each)
Use |g|=9.8 m/s^2: Please read each question carefully then please circle◯ the correct answer.

1) Using the appropriate number of significant figures, calculate **41.57 - (1.6374÷0.0530)**

a) 16.9 b) 16.87 c) 10.7 d) 10.67

2) The speed, *v*, of an object measured in meters per second (m/s) is given by the following equation $v = Ct^4$, where t refers to time in seconds. What should be the unit of C?
a) m/s^5 b) m/s^4 c) m/s^3 d) m/s^2

3) If the velocity versus time graph (v-t graph) of an object is a horizontal line, then the object is
a) at rest.
b) moving with constant non-zero acceleration.
c) moving with constant velocity.
d) moving with infinite velocity.

4) When an object is released from rest and falls in the absence of air resistance, which of the following is true concerning its motion?
a) Only its acceleration is constant.
b) Only its velocity is constant.
c) Neither its acceleration nor its velocity is constant.
d) Both its acceleration and its velocity are constant.

5) A car starts to move from rest and accelerates to a speed of 18 m/s in 4 seconds. If the car's acceleration remains constant, what is its speed after 6 more seconds?
a) 30 m/s b) 12 m/s c) 27 m/s d) 45 m/s

6) A stone is thrown from ground vertically upwards. If it reaches a height of 50 m above ground after 2 seconds, with which speed was the stone thrown?
a) 13.3 m/s b) 32.1 m/s c) 34.8 m/s d) 12.5 m/s

7) If the velocity of an object is $\vec{v} = (8\hat{x} - 15\hat{y})\frac{m}{s}$, then its speed and directional angle are
a) $7,\ 118^o$ b) $17,\ 298^o$ c) $17,\ 118^o$ d) $-7,\ 298^o$

8) If $\vec{A} = 4\hat{x} - 7\hat{y}$ and $\vec{B} = -12\hat{x} - 14\hat{y}$, then the magnitude of the vector $\vec{C} = 3\vec{A} - \vec{B}$ is

a) 32 b) 25 c) 15 d) 64

9) A particle moves in the x-y plane with a constant acceleration of $(5\hat{x} - 3\hat{y})$ m/s^2. If the velocity of the particle at a certain moment is $19\hat{x} - 10\hat{y}$ m/s, what is its velocity 5 seconds later?

a) $62\hat{x} - 32\hat{y}\ \ m/s$

b) $39\hat{x} - 22\hat{y}\ \ m/s$

c) $34\hat{x} - 19\hat{y}\ \ m/s$

d) $44\hat{x} - 25\hat{y}\ \ m/s$

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

Problem 1: You are driving your car at 72 km/h when suddenly a boy runs in front of you. You apply breaks and begin to decelerate at 4 m/s^2.
a) How far you go before stopping?

b) What is your speed when you have traveled half of the stopping distance in part (a)?

c) How long it takes for your speed to become 18 km/h

Problem 2: A football player kicks the ball from ground at 20 m/s at an angle of 60^o above horizontal toward a wall that is 30 m away.

a) (1 mark) How long does the ball take to hit the wall?

b) (1 mark) How high is the ball above ground when it hits the wall?

c) (1 mark) With which impact angle will the ball hit the wall?

Scratch paper