Prince Sultan University

Deanship of Educational Services

Department of Mathematics
and General Sciences

COURSE DETAILS:

Introduction to Physical Science	**SCI101**	**MAJOR EXAM I**
Semester:	Spring Semester -- Term 172	
Date:	Thursday March 15, 2018	
Time Allowed:	60 minutes	

STUDENT DETAILS:

Student Name:	
Student ID Number:	
Section:	Circle your section number: 173 174 175 176
Instructor's Name:	Circle instructor's name: Dr. Hazem Abu-Farsakh Dr. Muaffaq Nofal

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 when required 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**
Mark						
Full Mark	**13**	**3**	**4**			**20**

Part 1 (13 marks): Indicate the answer choice that best completes the statement or answers the question

Q1. A rolling ball eventually comes to a stop because
a) of inertia
b) of friction
c) it seeks its natural state of rest
d) all of the above

Q2. If gravity between Sun and Earth suddenly vanished, Earth would continue moving
a) in a curved path away from the sun
b) directly towards the sun
c) directly away from the sun
d) in a straight-line path

Q3. A dish falling on sand or falling on solid floor produces different results. Both experience:
a) different change in momentum
b) the same impulse
c) the same force
d) both a and b

Q4. The acceleration of a vertically upward thrown ball at the top of its path is about
a) zero b) 10 m/s^2 up c) 10 m/s^2 down d) none of the above

Q5. On the highway, a car moving at 120 km/h passes a truck moving at 80 km/h in the same direction. What is the velocity of the truck relative to the car?
a) 40 km/h backward b) 40 km/h forward c) 200 km/h backward d) 200 km/h forward

Q6. Which of the following is a vector quantity?
a) mass b) speed c) momentum d) time

Q7. A spacecraft continues in motion in space without using its engines due to
a) its own inertia b) gravity c) very low friction d) none of the above

Q8. A ball is thrown vertically upward at 40 m/s. What is its velocity after 6 seconds?
a) 20 m/s up b) 20 m/s down c) 100 m/s up d) 100 m/s down

Q9. A train has an average speed of 180 km/h. What distance it travels in 15 minutes?
a) 30 km b) 35 km c) 40 km d) 45 km

Q10. A car moving at 90 km/h brakes and stops in 5 seconds. What is the magnitude of the car's deceleration?
a) 5 m/s^2 b) 3 m/s^2 c) 5.4 m/s^2 d) 18 m/s^2

Q11. A 15 kg box is pushed with a 30 N force across the floor at constant velocity. The magnitude of the friction force on the box is
a) zero b) 15 N c) 30 N d) 60 N

Q12. How long it takes a ball dropped from a height of 10 m to reach the ground?
a) 1 second b) 5 seconds c) 0.5 seconds d) 1.4 seconds

Q13. As you push your friend who is more massive than you, the force on you compared to the force on your friend is
a) larger b) smaller c) zero d) both are equal

Part 2 (7 marks): Solve the following TWO questions in the provided space and show your solution.

Q1. **(3 marks)** An 80 kg box initially at rest is pushed across the floor with a horizontal force of 200 N. The force of friction between the box and the floor is 40 N. Calculate:

a) The net force on the box

b) The acceleration of the box

c) The velocity of the box after 2 seconds

Q2. **(4 marks)** A 2 kg ball of clay moving to the right at 4 m/s collides with a 3 kg ball of clay moving to the left at 3 m/s. The two balls stick together after the collision. Calculate:

a) The magnitude and direction of the velocity of the two balls after the collision

b) The impulse delivered to the 2 kg ball

c) If the collision lasted for 0.4 seconds, find the force of collision on the 2 kg ball

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