Prince Sultan University

Department of Science & Mathematics

SCI 101- General Sciences

First Major test

Term 171. Sunday Oct. 29, 2017

Examination Time : 1 hour

Name .....

Student I.D. .....

Section /class time: .....

Instructors. Dr. Asif Zaidi. ----------Dr. Hazim A.

Use g =10 m/s^2

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 **12 multiple choice questions**, each question worth **1 point**. **Part 2** has **two workout problems** each problem worth 4 **points**.*

Make sure your paper has all the questions and problems.

Part 1: 12 Multiple Choice Questions (1 mark each)

Q1. Which one among the following is a derived unit in SI system?

a) N b) m c) s d) Kg

Q 2. Which of the following quantities is a vector quantity?

a) Mass b) Time c) distance d) Weight

Q 3. A car travels at 100 km/h for 30 minutes; how much distance it will cover during this time?

a) 100 km b) 50 km c) 25 km d) 15 km

Q 4. What does the speedometer of your car measure?

a) The average speed. b) The average velocity.

c) The instantaneous speed. d) The instantaneous velocity.

Q. 5. A ball is given initial speed of 20 m/s in a gravity free space, circle the correct choice.

a) Ball will always move with 20 m/s. b) Ball will stop after sometime

c) Ball needs constant force to maintain its speed. d) Cannot determine

Q 6. If a car increases its velocity from 10 m/s to 70 m/s in 6 seconds. Its acceleration is;

a) 60 m/s^2 b) 5 m/s^2 c) 10 m/s^2 d) 720 m/s^2

Q 7. A ball is thrown straight upwards with initial speed of 20 m/s how high up it will go?

a) 5.5 m. b) 9.8 m c) 14 m d) 20 m.

Q 8. A box weighs 600 N on earth. This same box weighs 360 N on mars. What is the value of acceleration due to gravity on mars?

b) 1.67 m/s^2 b) 6 m/s^2 c) 10 m/s^2 d) 16.7 m/s^2

Q9. The statement "*Every object continues in a state of rest or uniform speed in a straight line unless acted upon by a nonzero force*" is known as:

a) Newton's first law of motion
b) Newton's Second law of motion
b) Newton's fourth law of motion
d) Newton's Third law of motion

Q10. A sky diver jumps from a plane, and 3.5 minutes after opening parachute he attains terminal speed. His acceleration towards ground at this point is;

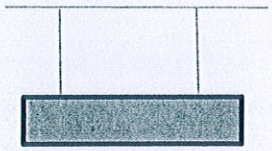
a) 0 m/s^2. b) 1.5 m/s^2 c) 2.5 m/s^2 d) 10 m/s^2.

Q11. A car of mass 2500 kg is moving initially at 108 km/h and its brakes fail on a level road. Car stops after moving 30 seconds. Force of friction on the car is;

a) - 1500 N. b) - 2500 N c) - 3500 N d) - 4000 N

Q12. A block of mass 1.5 kg is hanging by wires of the same strength (see diagram). Tension in each wire is;

a) 1.5 N. b) 5 N c) 7.5 N d) 9 N.



Part 2: Solve the following two problems in the space provided in between showing all your steps.

Problem 1: **(4 marks)**

A 200 g ball is dropped from a tall building. The ball reaches the ground level after 7 seconds. Ignore air resistance and answer following questions.

a) What is the height of this building?

b) What is the final speed of the ball just before it hits the ground?

c) What is the net force acting on the ball during its free fall?

d) What percentage of the total distance is covered by the ball in initial 4 seconds?

Problem 2: (4 marks)

A car of mass 1200 kg moving at 126 km/h stops in 4.6 seconds when the brakes are applied on a level road.

a) What is the initial speed of the car in SI units?

b) What is the deceleration of the car?

c) What is car's velocity after two seconds of applying brakes?

d) How much stopping force is applied on the car?

Scratch paper (Do not Remove)