KUWAIT COLLEGE OF SCIENCE & TECHNOLOGY
كليـــة الكـويت للعلـــوم والتكنولـوجيا
THE KNOWLEDGE NETWORK

PHYSICS TEST

Section A

1. All of the waves listed below are a part of the electromagnetic spectrum except;

a) sound waves
b) X-rays
c) light waves
d) radio waves

2. Mass and weight;

a) both measure the same thing
b) are exactly equal
c) are two different quantities
d) are both measured in kilograms

3. Archimedes' principle relates to:

a) the passengers in a bus tend to fall back when it starts suddenly
b) a brick feels lighter in water than in air
c) rocket propulsion
d) blue color of the sky

4. If a certain resistor obeys Ohm's law, its resistance will change:

a) as the voltage across the resistor changes
b) as the current through the resistor changes
c) as the energy given off by the electrons in their collisions changes
d) none of the above, since resistance is a constant for the given resistor

5. As a cat rubs its back along a carpet, it acquires a charge of $+6.4 \times 10^{-7}$ C. How many electrons did it lose to the carpet (The charge of an electron= 1.6×10^{-19}C.)

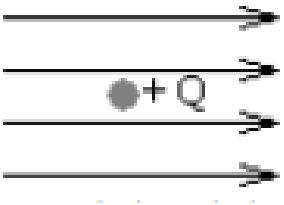
a) 0.25×10^{12}

b) $5.2x10^{12}$
c) 4
d) $4x10^{12}$

6. When a bird flies, the wings of the bird push air downwards and the air pushes the bird upwards. Here, the direction of the force on the air is opposite the direction of the force on the bird, this is due to

a) Newton's first law
b) Newton's second law
c) Newton's third law
d) Newton's law of gravitation

7. A stationary positive charge +Q is located in a magnetic field B, which is directed toward the right as indicated. The direction of the magnetic force on Q is:



a) toward the right
b) toward the left
c) up
d) there is no magnetic force

8. Which of the following temperatures is absolute zero?

a) 0◦C
b) −173◦C
c) −273◦C
d) −373◦C

9. Identify the pair whose dimensions are equal:

a) work and power
b) area and volume
c) density and resistivity
d) impulse and momentum

10. A body having uniform acceleration of 10 m/s^2 has a velocity of 100 m/sec. In what time its velocity will be tripled?

a) 8s
b) 10s
c) 14s
d) 20s

Section B

1. A physician measures the temperature of a patient and finds it to be 104 ^{0}F (F is Fahrenheit scale). What will be the temperature of the patient in Kelvin scale? $\left[you \quad can \quad use: T_F = \frac{9}{5}T_C + 32^0, \quad and \quad T_C = T_K - 273.15^0\right]$

2. Calculate the density of a solid cube that measure 5.00 cm on each side and has a mass of 350 g.

3. A 10000 kg truck is moving with a speed of 12 m/s. What speed would a 2000 kg SUV have to attain in order to have the same momentum as the truck.

4. A man drives a car from A to C. First half of the total distance he drives the car at a speed of 120 km/hr, and the last half of the total distance he drives at a speed of 80 km/hr. What is the average speed of the car?

$$(Definition: Average \quad speed = \frac{Total \quad distance}{Total \quad time})$$

5. How much time does it take to increase the temperature of 1 kg of water from 20 ^{0}C to 60 ^{0}C if we boil it in a 2kW electric kettle? (The specific heat of water = 4200 J/kg K.)

$$[\ \ Equation:\ P = \frac{mc\Delta T}{t}\ ]$$

6. How many 30µF capacitors must be connected in parallel to store a charge of 0.12 C with a potential of 200V across the capacitors??

7. Two charges, one twice as large as the other, are located 15 cm apart and experience a repulsive force of 95N. What is the magnitude of the larger charge? (coulomb's constant $k = 9 \times 10^9\ N\ m^2 C^{-2}$)

8. Three 2 Ω resistors, A, B and C, are connected as shown in Figure. Each of them dissipates energy and can withstand a maximum power of 18W without melting. Find the maximum current that can flow through the three resistors?