

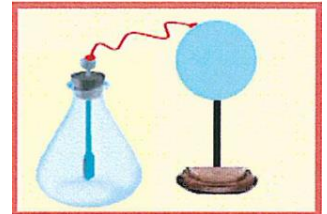
# Physics 12 MOCK final EXAM

## Term 1 , 2017-2018

**Question 1 :Choose the right answer :**

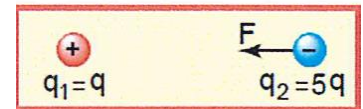
- 1) An insulated spherical conductor is connected to an electroscope , the leaves are still closed . which sentence is right if we bring a negatively charged rod near the conductor without touching :

- a) The leaves remain closed
- b) The leaves attract each other because they have opposite charges
- c) The leaves spread apart and they are both positively charged
- d) The leaves spread apart and they are both negatively charged



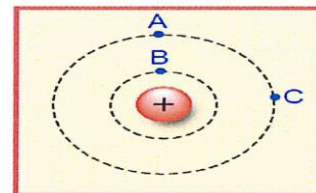
- 2) Charge  $q_1$  exerts a force  $F$  on  $q_2$  as shown . what is the magnitude and the direction of the force on  $q_1$  :

- a)  $5F$  to the right
- b)  $5F$  to the left
- c)  $F$  to the right
- d)  $F$  to the left



- 3) The dotted lines represent two equipotential surfaces around a positively charged point , which sentence describes the electric potential at B ?

- a) EQUAL TO THE ELECTRIC POTENTIAL AT C
- b) Less than THE ELECTRIC POTENTIAL AT C
- c) EQUAL TO THE ELECTRIC POTENTIAL AT A
- d) greater than THE ELECTRIC POTENTIAL AT A

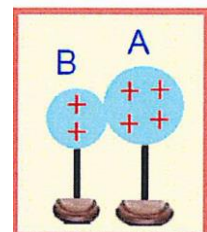


- 4) which of the physical quantities equal to ( the work needed to move a positive test charge from one point to another , divided by the magnitude of the test charge ) ?

- a) electric field strength at a point
- b) electric potential difference between two points
- c) electric potential energy of a test charge at a point
- d) electric force exerted on a charge at a point

- 5) the volume of conductor A is twice the volume of conductor B . choose the right relation about their voltages ?

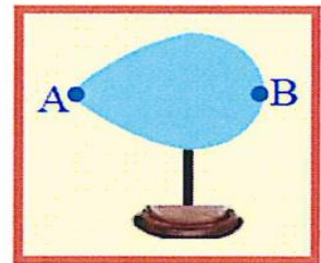
- a)  $V_A = V_B$
- b)  $V_A = 4 V_B$
- c)  $V_A = 1/2 V_B$
- d)  $V_A = 2 V_B$



- 6) The main function of the battery in the closed electric circuit is
- increases the electric potential energy of the flowing charges
  - decreases the electric potential energy of the flowing charges
  - decreases the flowing charges rate
  - transforms electric energy to thermal energy

- 7) two points A and B are located on the surface of the charged conductor as shown. choose the right relation about their electric field strengths and their voltages ?

	electric field strengths	voltages
a)	$V_A = V_B$	$E_A = E_B$
b)	$V_A < V_B$	$E_A < E_B$
c)	$V_A = V_B$	$E_A > E_B$
d)	$V_A > V_B$	$E_A = E_B$

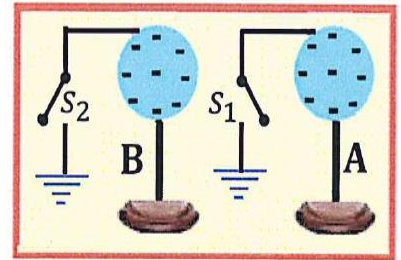


- 8) One of the processes to decrease the loss in electric energy transferred from power plants to the city , :
- increase the electric current in the transmission lines
  - reduce the output voltage coming out from power plants
  - increase the output voltage coming out from power plants
  - use small cross-sectional area wires
- 9) What happens to the current passing through an ohmic resistor when the voltage across it decreases to  $1/3$
- increases to  $1/3$
  - decreases to  $1/9$
  - decreases to  $1/3$
  - increases to  $1/9$
- 10) Three  $10 \Omega$  ohmic resistors are connected in series across a  $12 \text{ V}$  battery . if one resistor is burned , what is the value of the current passing through the other two resistors
- A
  - $0.60 \text{ A}$
  - $2.40 \text{ A}$
  - $3.60 \text{ A}$

**Question 2 :**

11) The diagram shows two charged spheres , A is a conductor and B is an insulator . Illustrate the electric status (positively charged or negatively charged or neutral ) of each one after switching on  $S_1$  and  $S_2$  . and explain why ?

- a) the electric status of A : .....  
 - the reason .....
- b) the electric status of B : .....  
 - the reason.....

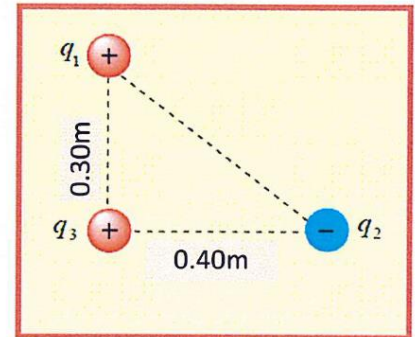


12) three point charges are located in air as shown in the figure .

(  $q_1 = + 4.5 \mu c$  ,  $q_2 = - 8.0 \mu c$  ,  $q_3 = + 6.0 \mu c$  )

a) Find the magnitude of the resultant electric force exerted on  $q_3$  ?

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 .....  
 .....



b) Find the direction at which  $q_3$  moves ?

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 .....

13) ANSWER THE FOLLOWING :

a) Explain what happens when a plastic rod is rubbed with a piece of wool. (considering the conservation of the charge law).

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 .....

b) Explain briefly how can you use the electroscope with a known charge to determine the type of another charged object.

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 .....  
 .....

14) A negative charge of  $5.0 \mu c$  it experiences a force of  $0.060 N$  to the right in an electric field , what are the field's magnitude and direction at that location ?

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 .....  
 .....

**Question 3**

15) If we add a charge of  $2.0 \times 10^{-5} \text{ C}$  to a capacitor, it's potential difference increases from 8.0 V to 12.0 V , find the capacitance of the capacitor.

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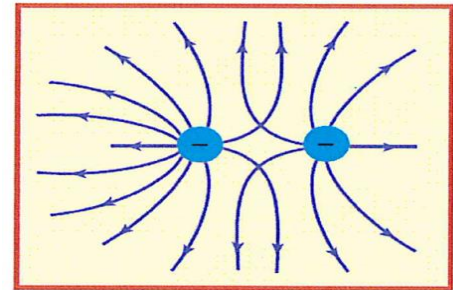
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16) A student drew an electric field lines around 2 negatively equal charges as shown in the figure. Write the 3 mistakes that the student made while drawing it.

- 1) .....
- 2) .....
- 3) .....



17) The points (a,b&c) are located inside a uniform electric field with magnitude of 6000 N/C Answer the following:

a) Which point (a,b&c) has the highest voltage

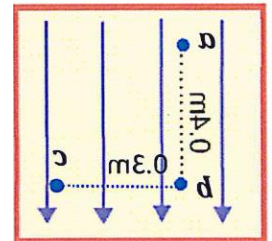
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b) Find the work done to move a proton from (b) to (a)

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18) two spherical isolated conductors one of them is solid and the other is hollow, the solid one was charged negatively and the hollow one was charged positively:

a) describe how was the charged distributed on each conductor.

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b) if each conductor is grounded (connected to the ground), what happens to the charge of each of them (doesn't changed – increases – becomes neutral)

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19) the table shows an electrical consumption bill during the month of October for one of the houses in Abu Dhabi, using those data to answer the following :

- a) write the name of the **physical quantity** that represent the difference between the two readings.

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- b) Find the cost of consumption during October, if 1 KW.h cost 0.30 DHS

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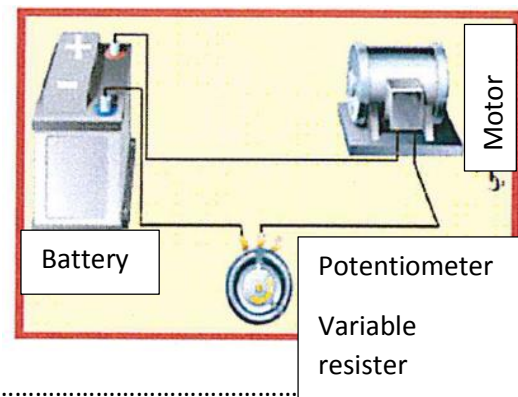
21462	Pervious reader <b>KW.h</b>
22200	current reader <b>KW.h</b>
738	<b>Different between the two reader</b> <b>KW.h</b>

**Question 4**

20) The figure shows a pictorial diagram for an electric circuit, study the diagram and answer.

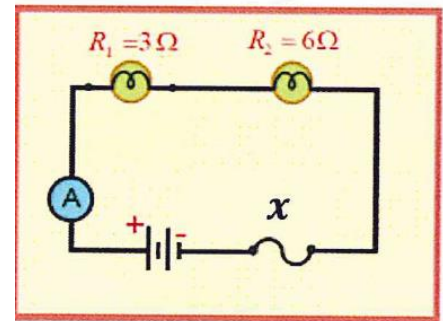
- a) how can you change the speed of the motor without adding or removing any of the content of the circuit

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- b) draw inside the box a schematic diagram for this circuit.

21) Study the figure and answer the following



a) compare between the two lamps according to the potential difference (the voltage) across each of them.

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b) Compare between the current that passes through the battery with the current that passes through each lamp.

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c) Add to a device that measures the potential difference across the lamp  $R_2$ .

d) Name the device (X) that is shown in the figure and what it's function in the circuit.

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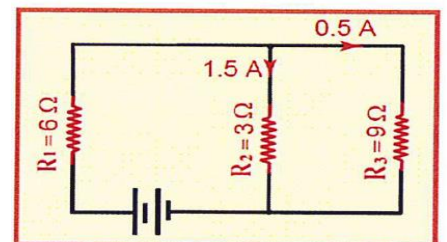
22) 3 identical resistors are connected in series with the battery. If it is reconnected with the same battery but in parallel , use the following terms ( increases, decreases, doesn't change)

To describe the change that happens to each of the following:

a) The equivalent resistor : (.....)

b) The electrical current that passes through each resistor (.....)

23) considering the circuit shown in the figure, calculate :



a) The equivalent resistor :

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b) the potential difference across the battery :

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c) the Power used by the resistor  $R_3$

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