Review 5 – electricity

For questions 1-2: A neutral object loses 4 X 10 18 electrons.

1. Does the object now have a positive or a negative charge?

2. What is the size of the charge on the object after losing the electrons?

For questions 3-5: Object A has a charge of +8 µC and object B has a charge of – 4 µC.

Objects A and B are 0.2 m apart and object A is left of object B.

3. Do the objects attract each other or repel each other?

4. What is the size and direction of the electric force object A exerts on object B?

5. If A and B are moved to 0.1 m apart, the force on A now will be

A twice as large and in the same direction.

B four times as large and in the same direction.

C one-half as large and in the opposite direction.

D one-fourth as large and in the opposite direction.

For questions 6-11: A charge of -0.2 C is motionless in a uniform electric field. The charge feels a force of 100 N to the right due to the electric field. The charge has a mass of 0.4 kg.

6. What is the direction of the electric field?

7. What is the electric field strength?

8. What is the electrical potential difference between two points in the field that are 0.8 m apart?

9. How much work does the electric field do in moving the charge between the two points in question 8?

10. What is the kinetic energy of the charge after the move in question 9?

11. What is the speed of the charge after the move in question 9?

For questions 12-14: A point charge Q has a charge of +6 X 10 -6 C.

12. What is the electric field strength at a point P which is 1.7 m from Q?

13. Is the electric field at this point directed toward Q or away from Q?

14. Which change below would probably produce the largest increase in the electric field strength?

A Increase the charge on Q and move point P closer to Q.

B Increase the charge on Q and move point P farther away from Q.

C Decrease the charge on Q and move the point P farther away from Q.

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D Decrease the charge on Q and move the point P closer to Q.

15. An electroscope has a negative charge.

When a charged rod is brought close to the

electroscope, the leaves spread farther apart.

What is the charge on the rod?

A The rod must be positive.

B The rod must be negative.

C The rod must be neutral.

D The charge on the rod could be positive or

the charge on the rod could be negative.

For 16-18: A motor draws 0.25 A from and 18-volt battery for 6 minutes.

16. What is the resistance of the motor?

17. What is the power rating of the motor?

18. How much electrical energy in joules did the motor use?

For the circuit shown right:

D

B

C

A

19. Identify which devices, resistors and source,

are in parallel with each other, if any.

20. Identify which devices, resistors and source,

are in series with each other, if any.

21. What is the total resistance of the circuit?

22. How much total current is flowing through

Vsource = 65 volts

RA = 15 Ω

RB = 100 Ω

RC = 25 Ω

RD = 75 Ω

the circuit? What is the source current?

23. Calculate the following quantities:

(a) the current through resistor A.

(b) the voltage across resistor B.

(c) the current through resistor C.

(d) the voltage across resistor D.