ETGR 2106 HOMEWORK #1. (Circled problems only)

SECTION 2.3 Voltage

7. What is the voltage between two points if 120 mJ of energy are required to move 4.8 C between the two points?

8. If the potential difference between two points is 42 V, how much work is required to bring 6 C from one point to the other?

9. Find the charge Q that requires 96 J of energy to be moved through a potential difference of 16 V.

10. How much charge passes through a radio battery of 9 V if the energy expended is 72 J?

SECTION 2.4 Current

11. Find the current in amperes if 650 C of charge pass through a wire in 50 s.

12. If 465 C of charge pass through a wire in 2.5 min, find the current in amperes.

13. If a current of 40 A exists for 1 min, how many coulombs of charge have passed through the wire?

14. How many coulombs of charge pass through a lamp in 2 min if the current is constant at 750 mA?

15. If the current in a conductor is constant at 2 mA, how much time is required for 6 mC to pass through the conductor?

16. If $21.847 \times 10^{+18}$ electrons pass through a wire in 12 s, find the current.

17. How many electrons pass through a conductor in 1 min and 15 s if the current is 4 mA?

18. Will a fuse rated at 1 A "blow" if 86 C pass through it in 1.2 min?

*19. If $0.84 \times 10^{+16}$ electrons pass through a wire in 60 ms, find the current.

*20. Which would you prefer?

a. A penny for every electron that passes through a wire in 0.01 μs at a current of 2 mA, or

b. A dollar for every electron that passes through a wire in 1.5 ns if the current is 100 μA.

*21. If a conductor with a current of 200 mA passing through it converts 40 J of electrical energy into heat in 30 s, what is the potential drop across the conductor?

*22. Charge is flowing through a conductor at the rate of 420 C/min. If 742 J of electrical energy are converted to heat in 30 s, what is the potential drop across the conductor?

*23. The potential difference between two points in an electric circuit is 24 V. If 0.4 J of energy were dissipated in a period of 5 ms, what would the current be between the two points?

SECTION 2.6 Ampere-Hour Rating

24. What current will a battery with an Ah rating of 200 theoretically provide for 40 h?

25. What is the Ah rating of a battery that can provide 0.8 A for 75 h?

26. For how many hours will a battery with an Ah rating of 32 theoretically provide a current of 1.28 A?

SECTION 2.10 Ammeters and Voltmeters

34. What are the significant differences in the way ammeters and voltmeters are connected?

35. If an ammeter reads 2.5 A for a period of 4 min, determine the charge that has passed through the meter.

36. Between two points in an electric circuit, a voltmeter reads 12.5 V for a period of 20 s. If the current measured by an ammeter is 10 mA, determine the energy expended and the charge that flowed between the two points.