

Aug 2003 416

1. D
2. D
3. B
4. C
5. B E1 and E4 both have 12 protons (isotopes are the same element with different number of neutrons)
6. C pure water is a poor conductor
7. D
8. B
9. B
10. D
11. D
12. C = 0.0096 kW(4h/d)(30 d) (\$0.05/kWh)
13. D R = 10 Ω (highest so lowest conductance)
14. B
15. -
16. B
17. -
18. C
19. A

June 2004 416

1. A
2. C
3. C
4. A
5. D
6. B
7. D
8. B
9. B
10. A
11. A
12. B
13. C
14. C
15. C
16. D
17. A
18. D
19. B

20.

ELEMENT	Number of valence	Chemical Family Name
Br	7	halogen
Ca	2	Alkaline earth
Na	1	Alkali
Ne	8	Noble

21. 12,13,14

22. $V_1 = I R_1$

$$4 = 4 R_1$$

$$R_1 = 1 \Omega.$$

$$V_t = I R_t$$

$$12 = 4 R_t$$

$$R_t = 3 \Omega.$$

$$R_2 = 3 - 1 = 2 \Omega.$$

23. $Pt = E = 0.36 \text{ kW (12h/day) (30 days) = 129.6 kWh}$

$$\text{Cost} = E * \text{rate} = 129.6 \text{ kWh} * 0.06/\text{kWh} = \$7.78$$

24. $50V_1 = 20(0.200)$

$$V_1 = 0.080 \text{ L}$$

25. $\text{CH}_4 + 2 \text{O}_2 \rightarrow \text{CO}_2 + 2 \text{H}_2\text{O}$