Higher Chemistry 2003 Multiple Choice – Worked Solutions

1. Look at the bonding of each substance. Ionic compounds will not conduct when solid but when they molten or in solution will conduct. Answer **C**
2. Answer **D**
3. Adding sodium sulphate, i.e. a salt, will increase the rate of corrosion. Attaching a copper nail will result in corrosion as copper is below iron in the electrochemical series. If carbon dioxide is passed through the water a weak acid is created which will increase the rate of corrosion. Therefore Answer **B**
4. Nitrogen occurs as a diatomic molecule and therefore the following combinations could occur 14 – 14, 14 – 15, 15 – 15. Answer **C**
5. NaCl Na2SO4
   0.6 0.6 0.4 0.2 Total Na = 0.6 + 0.4 = 1mole Answer **D**
6. Increasing the mass of copper carbonate will increase the gas evolved and therefore the mass will be less at the end of the reaction. Answer **B**
7. 3.6g → 134kJ
   72g → (134/3.6) x 72 = -2680kJmol-1 (negative as reaction exothermic). Answer **C**
8. Look at the electronegativity table. The combination with the greatest difference in electronegativity has the most ionic character. Answer **B**
9. The first ionisation energy of an element is the energy to remove one mole of electrons from one mole of gaseous atoms. Answer **C**
10. Answer **D**
11. Answer **D**
12. Answer **A**
13. Answer **B**
14. Copper phosphate = Cu3(PO4)2 Therefore 5 moles of ions. Answer **D**
15. 1 mole of H2 → 2g → 6.02x10^23 molecules. Answer **C**
16. C4H10 + 6.5O2 → 4CO2 + 5H2O
    1vol 6.5 vol
    1 litre 6.5 litres Answer **C**
17. Answer **A**
18. Draw out the molecules. Each is an alkane bar compound C. Answer **C**
19. Draw out each structure and find that Answer **A**
20. A tertiary alcohol is where the OH group is attached directly to a carbon atom containing at no hydrogen atoms. Answer **B**
21. Draw out the structure and corresponding ketone to find 2 H atoms are removed therefore 2g per mole is lost. Answer **A**
22. Answer **C** as water is removed.
23. Answer **D**
24. Answer **D**
25. Ammonia contains Nitrogen and the only other answer containing nitrogen is an amine. Answer **A**
26. Fat are saturated whereas oils are unsaturated (i.e. contain double bonds). Answer **D**
27. Count the number of OH groups present as this is where the fatty acids can react.

Answer **C**

28. Answer **A**
29. Answer **B**
30. In order to obtain target equation p. P = Q + R – S. Answer **A**
31. Answer **D**
32. Exothermic reactions favour low temperatures. Also the pressure should increase in order to obtain more solid as there are less gas volumes on that side of the equation. Answer **B**
33. Answer **A**
34. [H+][OH-] = 10^-14 therefore Answer **D**
35. Answer **B**
36. Create a redox equation and form the ratios to find Answer **D**
37. Answer **C**
38. Half life is **<u>ALWAYS</u>** the same however intensity may vary. Answer **C**
39. Beta = 0

    E Answer **A**

    -1
40. Answer **B**