1. Give the formulae for these compounds:
    (a) Carbon monoxide
    (b) iron (II) oxide
    (c) chloric (III) acid
    (d) potassium bromate (VII)

2. Give the formulae for these compounds:
    (a) Nitrogen monoxide
    (b) copper (II) oxide
    (c) bromic (V) acid
    (d) sodium nitrite

3. Give the formulae for these compounds:
    (a) Nitrogen dioxide
    (b) iron (III) oxide
    (c) iodic (I) acid
    (d) lithium nitrate

4. Give the formulae for these compounds:
    (a) Sulphur trioxide
    (b) copper (I) oxide
    (c) bromic (III) acid
    (d) sodium sulphate

5. Name the following compounds:
    (a) HI (g)
    (b) AlF_3
    (c) H_2SO_4
    (d) $Au(ClO_4)_3$

6. Name the following compounds:
    (a) HF (aq)
    (b) $CrBr_3$
    (c) H_2SO_4
    (d) $Zn(BrO_2)_2$

7. Name the following compounds:
    (a) HCl (aq)
    (b) $FeCl_3$
    (c) H_2SO_3
    (d) $Mn(ClO)_2$

8. Name the following compounds:
   (a) HBr (g)
   (b) ZnF_2
   (c) HNO_3
   (d) $Pb(IO_3)_2$

9. What is the mass of 5.25 moles of silicon?

10. What is the mass of 7.25 moles of potassium?

11. What is the mass of 4.25 moles of phosphorus?

12. What is the mass of 6.5 moles of sulphur?

13. How many moles are there in 21g of nickel?

14. How many moles are there in 14g of titanium?

15. How many moles are there in 34g of manganese?

16. How many moles are there in 27g of gallium?

17. How many atoms are there in 18g of chromium?

18. How many atoms are there in 17g of vanadium?

19. How many atoms are there in 21g of zinc?

20. How many atoms are there in 15g of cobalt?

21. How many molecules of nitrogen (N_2) are there in 35g of the gas?

22. How many molecules of fluorine (F_2) are there in 42g of the gas?

23. How many molecules of bromine (Br_2) are there in 34g of the liquid?

24. How many molecules of chlorine (Cl_2) are there in 25g of the gas?

25. What mass of $MgCl_2$ is needed to make $200cm^3$ of 2.0M solution?

26. What mass of $BeCl_2$ is needed to make $500cm^3$ of 1.5M solution?

27. What mass of KCl is needed to make $600cm^3$ of 1.5M solution?

28. What mass of $CaCl_2$ is needed to make $300cm^3$ of 2.0M solution?

29. An element Jt has three isotopes:

64% ^{34}Jt; 22% ^{36}Jt; 14% ^{38}Jt.

Calculate the RAM of Jt.

30. An element Lb has three isotopes:

35% ^{19}Lb; 13% ^{21}Lb; 52% ^{23}Lb.

Calculate the RAM of Lb.

31. An element Bf has three isotopes:

27% ^{40}Bf; 45% ^{41}Bf; 28% ^{43}Bf.

Calculate the RAM of Bf.

32. An element Bo has three isotopes:

40% ^{52}Bo; 23% ^{53}Bo; 37% ^{55}Bo.

Calculate the RAM of Bo.

33. Here are the first 5 ionisation energies of an element:

1st	2nd	3rd	4th	5th
801	2427	3660	25026	32827

(a) Calculate the $\log_{10}$ of each energy and draw a sketch graph of 'number of ionisation energy' against '$\log_{10}$ ionisation energy'.
(b) Why are there sometimes very large differences between one ionisation energy and the next?
(c) Which element could these be the ionisation energies for?
(d) Write the definition of 'first ionisation energy'.

34. Here are the first 5 ionisation energies of an element:

1st	2nd	3rd	4th	5th
578	1817	2745	11577	14842

(a) Calculate the $\log_{10}$ of each energy and draw a sketch graph of 'number of ionisation energy' against '$\log_{10}$ ionisation energy'.
(b) Why are there sometimes very large differences between one ionisation energy and the next?
(c) Which element could these be the ionisation energies for?
(d) Write an equation for the first ionisation of this element.

35. Here are the first 5 ionisation energies of an element:

1^{st}	2^{nd}	3^{rd}	4^{th}	5^{th}
1087	2353	4621	6223	37831

(a) Calculate the $\log_{10}$ of each energy and draw a sketch graph of 'number of ionisation energy' against '$\log_{10}$ ionisation energy'.
(b) Why are there sometimes very large differences between one ionisation energy and the next?
(c) Which element could these be the ionisation energies for?
(d) Write an equation for the second ionisation of this element.

36. Here are the first 5 ionisation energies of an element:

1^{st}	2^{nd}	3^{rd}	4^{th}	5^{th}
419	3052	4420	5877	7975

(a) Calculate the $\log_{10}$ of each energy and draw a sketch graph of 'number of ionisation energy' against '$\log_{10}$ ionisation energy'.
(b) Why are there sometimes very large differences between one ionisation energy and the next?
(c) Which element could these be the ionisation energies for?
(d) Write an equation for the first ionisation of this element.

37. Explain why the first ionisation energies of elements generally increase as you go across a period of the periodic table from left to right.

38. Explain why the first ionisation energy of beryllium is higher than that of boron.

39. Explain why the first ionisation energies of elements decrease as you go down a group of the periodic table.

40. Explain why the first ionisation energy of magnesium is higher than that of aluminium.

41. (a) Write the electronic configuration of iodine using s,p,d,f notation.
(b) Write the electronic configuration of radium using the previous noble gas abbreviation of s,p,d,f notation.
(c) Show the electronic configuration of phosphorus using the 'electrons-in-boxes' notation.
(d) Show the electronic configuration of germanium using an energy level diagram.

42. (a) Write the electronic configuration of cadmium using s,p,d,f notation.
(b) Write the electronic configuration of tin using the previous noble gas abbreviation of s,p,d,f notation.
(c) Show the electronic configuration of sulphur using the 'electrons-in-boxes' notation.
(d) Show the electronic configuration of selenium using an energy level diagram.

43. (a) Write the electronic configuration of caesium using s,p,d,f notation.
(b) Write the electronic configuration of silver using the previous noble gas abbreviation of s,p,d,f notation.
(c) Show the electronic configuration of oxygen using the 'electrons-in-boxes' notation.
(d) Show the electronic configuration of iron using an energy level diagram.

44. (a) Write the electronic configuration of antimony using s,p,d,f notation.
(b) Write the electronic configuration of cobalt using the previous noble gas abbreviation of s,p,d,f notation.
(c) Show the electronic configuration of silicon using the 'electrons-in-boxes' notation.
(d) Show the electronic configuration of vanadium using an energy level diagram.

45. (a) Draw a 'dot / cross' diagram showing the bonding in calcium fluoride.
(b) Which type of bonding is this?

46. (a) Draw a 'dot / cross' diagram showing the bonding in aluminium fluoride.
(b) Which type of bonding is this?

47. (a) Draw a 'dot / cross' diagram showing the bonding in lithium oxide.
(b) Which type of bonding is this?

48. (a) Draw a 'dot / cross' diagram showing the bonding in strontium oxide.
(b) Which type of bonding is this?