**CHEM F2 X/80 MKS**

1. **a)** Q 2, 3, 6 🗸1

R 2, 8, 3🗸1

b) R2Q3 🗸1

1. It is required to break the strong N-=N 🗸 1triple covalent bond.
2. Advantages.
* Prevents knocking of engines
* Prevents premature ignition
* Increase the octane rating number (any 🗸1)
* Disadvantage: Lead causes environmental pollution√1.carcinogenic√1
1. a) I CaO(s) +H2O(l) Ca (OH)2 (aq)

 II Ca (OH)2 + CO2 CaCO3 (s) + H2O (l)

1. Excess oxygen🗸1 and nitrogen🗸1/helium🗸1/neon/argon (accept a name of inert gas)
2. a) Oxalic acid🗸1/2 and concentrated sulphuric acid🗸½
3. NaOH(aq) +CO2(g) Na2CO3(aq) +H2O(l)
4. CO: Colorless🗸½ and odorless🗸1/2
5. a) Y-At room temperature (250c) Y is a liquid since its M.P and B.P lie between -7oc and 58.80c OR

 (room temperature is between M.P and B.P.)

 b) The molecular mass of x is higher🗸1 than that of Z; the Vander Waals forces are stronger 🗸in X molecules than in Z molecules hence X has a higher boiling point than Z.

1. a) I water 🗸 ½ mk

 II concentrated sulphuric acid🗸 ½ mk

1. 2Na2O2(s) +2H2O(l) 4NaOH(aq) +O2(g)  🗸 1

**Cardboard with a hole in it.🗸1**½ **mk**

**Gas jar🗸**½ **mk**

**Dry oxygen**

1. ) Add 200cm3 of 2M HNO3 to 200cm3 of 2M NaOH√1

 Filtrate with a suitable indicator get end point🗸1/2-repeat without indicator🗸1/2

 Crystallize the filtrate🗸½

2NaNO3(s) 2NaNO2(s) +O2(g)

1. 2HNO3(l) +Mg(s) Mg(NO3)2(aq)+ NO2(g)+H2O(l)

Mg(s) +2HNO3 (aq) Mg (NO3)2(aq) +H2(g)

1. a) Add distilled🗸1/2 water to the soil sample and stir. Add 2 drops of universal indicator🗸1/2 to the

 mixture and compare with the PH chart🗸½.

* Extensive use of acidic fertilizers√1
* Pollution by acid rain. (any 🗸1)

|  |  |  |
| --- | --- | --- |
| Salt | Adding water | Heating |
| Calcium carbonate | Does not dissolve√1/2 | Forms a white solid/precipitate√1/2 |
| Calcium hydrogen carbonate | Dissolves to form a colorless solution√1/2 | Forms a white solid and a colorless liquid form on the upper cooler parts of the apparatus√1/2 |

* Place the mixture on a piece of paper and put a magnet 🗸1above the mixture to attract iron filings
* Heat the remaining part of the mixture for Al2Cl3 🗸1to sublime and collect sublimate.
* Calcium chloride will remain at the bottom of the tube.🗸1

13.H2SO4(aq) + Zn(s) ZnSO4(aq) + H2(g)√1

2H2O(g) + O2(g) 2H2O(l)√1

1. Burns with a ‘pop’ sound when ignited in presence of air.√1

14- Components can be separated physically.√1

* + - * 1. Does not react as air but its components react independently√1
				2. When subjected to condensation different components condense at different temperatures.√1

15.) Oxygen gas√1

(ii) 2HOCl(aq) 2HCl(aq) + O2(g)√1

16(a) (i) K

 (ii) J√1

1. HCl does not dissociate fully in methyl benzene.√1

17) N – 2.5√1 x

H – 1 •

√1

18(a) A salt that consists of two different salts in one crystal of the molecule.√1

(b) (i) 2Na2CO3NaHCO3 + 6HCl 6NaCl + CO2 + H2O√1

 (ii) MgCO3. Mg(OH)2 + 4HCl 2MgCl2 + CO2 + 3H2O√1

19(a) B moves the furthest distance compared to steroid A.√1

(b) 3,2√1

20.(i) Energy required by an element to lose one electron in its outermost energy level in the

Gaseous state.√1

* + - 1. After losing the first electron the remaining electrons are firmly attracted by same number of protons hence require more energy for the second electron to be lost.√1
			2. 420 + 3100 + 4800

= 8320KJ√1

21.(i) To displace air in flask H over the hot copper turnings.√1

 (ii) The brown solid changes to black√1

 (iii) Nitrogen, carbon (IV) oxide, argon, (Xenon, neon) (Any one)√1

 (iv) 410cm3√1

 (v) $\frac{\left(500 ×410\right)}{500}×100= \frac{90 ×100}{500}=18\%$ √√2

 **b.** (a) Black CuO turns to red-brown Cu.√1

 (b)$2H\_{2(g)} + O\_{2(g)} 2H\_{2}O\_{(l)}$√1

 (c)To determine the reducing property of hydrogen. 🗸1 Hydrogen is above Cu 🗸1 in the reactivity series, thus it reduces the oxygen from CuO.

22. (a) i) T - 2.8.5 🗸 ½

 W - 2.8.8 🗸 ½

 (ii) Q - Basic Oxide 🗸1

 U - Acidic oxide 🗸1

 (b) The two elements exhibit allotropy.

 (c) (i) There is gradual increase in the strength of the metallic bonds 🗸1 due to the increase in the number of

 delocalized (valence) electrons in the element 🗸1

 (ii) The atomic radius of V is smaller than that of U. 🗸1 V has more protons therefore has a stronger nuclear

 attraction hence the smaller atomic radius. 🗸1

 (iii) Elements U, V and W have simple molecular structures 🗸1 in which the molecules are held by weak Van

 der waals forces. The Van der waals 🗸1 forces weaken from U to W.

 (d) (i) The atomic radius of V is smaller than that of U. 🗸1

 (ii) It has a stable electron configuration hence does not ionize.

23.(a) B ½ - It looses 3 electrons and the remaining electrons are strongly held than before due to less repulsion. (1 Mark)

(b) C ½ - It has the weakest nuclear charge among the non-metals given (1 Mark)

24.(a) 2CO(g) + O2(g) 2CO2(g) ✓1

(b) – Carbon (II) Oxide ✓1

(c) - Extraction of metals ✓1

 -combines with hydrogen to form water gas used as fuel.√1