**END TERM 1-2023**

**CHEMISTRY (233)**

**FORM TWO (2)**

**TIME: 2 HOURS**

**MARKING SCHEME**

|  |  |  |
| --- | --- | --- |
| **QNS** | **RESPONSE** | **MRKS** |
| **1a** | **Thistle funnel is not inserted in the solution. This can lead to escape of gas prepared** | **1mk** |
| **1b** | **less denser than air** | **1mk** |
| **1c** | **Zn(s)+H2SO4(aq) →ZnSO4aq +H2g)** | **1mk** |
| **2** | **Iron nail coated with tin will rust while the iron nail coated with zinc will not rust.**  **Iron is more reactive than tin and will lead to rusting while zinc is more reactive than iron** | **1mk**  **1mk** |
| **3a** | **manganese(IV)oxide** | **1mk** |
| **3b** | **2H2O2(l)→2H2O(l) +O2(g)** | **1mk** |
| **3c** | **1. Oxygen is used to burn fuels such as those used for propelling rockets.**  **2. A mixture of oxygen and acetylene burns to produce a very hot flame used in welding and for cutting metals.**  **3. During steel making, oxygen is used to remove iron impurities.**  **4. Oxygen is used as one of the reactants in fuel cells.** | **2mk**  **any 2** |
| **4a** | **Period 3 group V** |  |
| **4b** | **Y3-** |  |
| **4c** | **Ionic radius is larger than its atomic radius**  **Element Y forms its ion by gaining 3 electrons. the incoming electrons increases repulsion of electrons in energy level hence increasing the size if the ion** | **1mk**  **1mk** |
| **5** | **let percentages be x% and y%**  **6x+7y=694**  **x+y =100**  **x=100-y**  **6(100-y)+7y=694**  **y=94%, x=6%** |  |
| **6** | **Proton are positively charged while electrons are negatively charged**  **Protons have atomic mass unit of 1 while electrons have negligible atomic mass unit (1/1840)** | **2mks** |
| **7a** | **Increase the surface area for the vapour of liquid whose boiling point has not been reached to condense and flowback to the round bottomed flask** | **1mk** |
| **7b** | **Methanol**  **It has a lower boiling point compared to propanol** | **2mks** |
| **7c** | **condensation will take place but not efficintly** | **1mk** |
| **8a** | **their outermost energy levels are completely filled with electrons hence they do not lose or gain electrons under ordinary conditions** |  |
| **8b** | **comparatively alkaline earth metals have smaller atomic radius than alkali metals/they have stronger nuclear charge than alkali metals**  **Hence they do not loss electrons easily** | **2mks** |
| **9a** | **P and S** | **1mk** |
| **9b** | **Q** | **1mk** |
| **10**  **I** | **Concentrated sodium hydroxide solution/concentrated potassium hydroxide solution** |  |
| **10**  **Ii** | **Cool the air to -250C**  **vapour is condensed and frozen to solid ice** | **2mk** |
| **Iii** | **-2000C** | **1mk** |
| **Iv** | **Nitrogen→Argon→oxygen** | **1mk** |
| **11i** | **Starts to boil at 1000C to 1080C. it boils at a range of temperature** | **1mk** |
| **Ii** | **Impure water**  **It boils at a range of temperature** | **2mk** |
| **Iii** | **Raises the boiling point**  **Boils at a range of temperature** | **2mks** |
| **Iv** | **Lowers the boiling point**  **Melts at a range of temperature** | **2mks** |
| **12a** | **In i) magnesium combine chemically with oxygen gas**  **While in air magnesium combine chemically with both oxygen and nitrogen gas** | **2mks** |
| **B** | **2Mg(s) +O2(g) →2MgO(S)**  **3Mg(s) +N2(g) →Mg3N2(S)** | **2mk** |
| **13a** | **The active part of air(oxygen) has been used up for rusting. No more reaction rusting** | **2mk** |
| **B** | **(1000-800)/1000=0.02**  **0.02/100=20%** | **2mk** |
| **14** | **The components of air are not chemically combined and can separated through physical means**  **The components of air maintain their physical properties** | **2mk** |
| **15** | **i) 20 ii)R iii)W,V,R**  **iv)react by gaining electron hence electron repulsion in the energy levels increases** | **5mks** |
| **16** | **i) 2Fe2O3(s) + 6CO(g) 🡪 4Fe(s) + 6CO2(g)**  **ii) Oxidizing Fe2O3 , reducing CO(g)**  **iii)Extraction of metals, Electroplating** | **5mks** |
| **17** | **a). It sublimes without leaving wetness**  **b) it is a better coolant at -780C compared to ice 00C**  **It sublimes without leaving wetness**  **c) Aluminium chloride, iron(III) chloride, iodine, Benzoic acid**  **d) freeze drying to preserve food products** | **5mk** |
| **18a** | **33x2) +(30x1) =96**  **96/3= 32** | **2mks** |
| **B** | **30+35=65** |  |
| **C** | **30** |  |
| **19** | **Darts on the surface of water, hissing sound, melt into silvery ball** | **3mks** |
| **20** | 1. **Q it has 4 occupied energy levels** 2. **Q it has the largest atomic radius hence highest tendency to losevalence electrons** |  |
|  | **Totals** | **80mks** |