UCE MARKING GUIDE

CHEMISTRY

NO.	QUESTION	REMARKS	MARKS
NO.1	**ITEM I**		
	SECTION A		**2 scores**
(a)	Bar soap occ: soapy detergent Or Bar soap solution		
(b)	When bar soap is placed in water it <u>dissolves</u> to form <u>hydroxide</u> ions which can neutralize the hydrogen ions in formic acid from a bee sting $H^{+}_{(aq)} + OH_{(aq)} \longrightarrow H_2O_{(l)}$ In a reaction known as neutralization.		**3 scores**
(c)	Excessive use of soapy detergent / Bar soap can result into; 1. Skin irritations which would lead to burns or <u>mitigation.</u> 2. Use measurable amount of soap in a given amount of water. 3. Irrigate with lots of water where you feel irritated.		**3 scores** **1 score**
	Evaluation. <u>Alternatively</u> Amina can resort to: 1. Alvoera 2. Ash from banana peelings.		
No.2 (a)(i)	**ITEM 2** **A and B** are metal solids. - Metal solids are elements which become stable by electrons - They are characterized by high melting and boiling points e.g Aluminium, zinc, copper, iron.		**3 scores**
	C is a liquid. **B** is not a Non-metallic solid. - Non-metals are elements which become stable by gaining electrons.		**3scores**

	- Thet are characterized by low melting and boiling points. E.g carbon, silicon, chlorine, argon etc.		
(ii)	**E and F** are Gases. **A –** can be used in electricity transmission because of its good electrical and heat conductivity.		**2cores**
(b)(i)	**A –** is used in construction of strong and heavy bridges due to its high melting and boiling points.		**2scores**
(ii)	1. It is possible to prepare/extract or manufacture oxygen on a large scale for respiration in hospitals. 2. Elements like iron is able to build red blood cells in the body. Thus used to make drugs. 3. Some elements can expand when heated hence applied in the thermometers.		
	1. Elements like Nitrogen improves crop yield when added in form of fertilizers thus boosts agricultures. 2. Water treatment is possible by use of chlorine to disinfect water since it can kill bacteria. 3. Extraction of metals from their ores using coke. (carbon) has reducing properties. 4. Galvanization and electroplating since its possible use electrolysis and reactivity series.		**2scores**
NO.3	**ITEM 3** **<u>Manufacture of Ethanol</u>** **Raw materials.** 1. Bananas as a source of starch. 2. Spear grass. 3. Pounded sorghum as a source of yeast. 4. Banana leaves 5. Water 6. Wooden boat. **<u>Process of production.</u>** 1. Ripe yellow banana, banana leaves and spear grass are added in a wooden boat with some water. 2. The mixture is squeezed / crushed to extract out juice from the banana.		**2scores**

	3. The formed juice is filtered using spear grass and pounded powder of sorghum is added. 4. The mixture is kept for 3-5 days covered with dry bananas in a warm place to allow glucose to ferment to ethanol. $C_6H_{12}O_{6(l)} \xrightarrow{\text{zymase}} CH_3CH_2OH_{(aq)} + CO_{2(g)}$ 5. The crude ethanol obtained is <u>fractionally distilled</u> to obtain pure ethanol. 6. The ethanol is stored in clean dry containers. **<u>Side effects and mitigation.</u>** 1. Hot surface burns from distillation tanks that cause wounds hence pain. **<u>Mitigation</u>** Proper use of required personal projective equipment. **<u>Social benefits</u>** Employment opportunities which brings about increased income hence improved standards of living.		**3scores** **3cores** **3scores**
No.4	**ITEM 4** **<u>Raw materials</u>** 1. Sulphur. Acc: sulphurdioxide. 2. Oxygen gas from atmospheric air. **<u>Process of production.</u>** - During sulphurdioxide gas freed from impuritives is heated with dry pure oxygen gas at low temperature (of about 450^0c), high pressure (of about 1-3 atm) in presence of vanadium(v) oxide catalyst forming sulphur trioxide. This occurs in a <u>combustion cylinder.</u> $2SO_{2(g)} + O_{2(g)} \longrightarrow 2SO_3(g)$. - Sulphur trioxide is dissolved in little concentrated sulphuric acid forming fuming liquid called <u>Oleum</u> in a tank.		**2scores** **3scores**

	$SO_{3(g)} + H_2SO_{4(l)} \longrightarrow H_2S_2O_{7(l)}$ - Oleum is added to a regulated volume of distilled water form 98% concentrated sulphuric acid. $H_2S_2O_{7(l)} + H_2O_{(l)} \longrightarrow 2H_2SO_{4(l)}$ - The produced sulphuric acid is 98% concentrated and its stored in safe plastic or glass containers. **<u>Side effects and mitigation.</u>** - Hot surface burns from combustion cylinder causing wounds hence pain to workers and this can be mitigated by proper use of required personal protective equipment **Or** - Poisonous fumes by waste gases which when inhaled can cause respiratory disorder. This can be mitigated by fitting catalytic converters in exhaust pipes of the machines to convert oxides of sulphur into less toxic oxides. **<u>Social benefits.</u>** 1. Employment opportunities which results into increased incomes hence improved standards of living. 2. Empowers the agricultural sectors through production of fertilizers like Ammonium sulphate. 3. Source of Electricity to the community sulphuric acid being a strong electrolyte in batteries.		**3scores** **3scores**
No.5	**ITEM 5** **<u>Natural resources.</u>** - Category – Rocks are non-renewable resources. This is because they can not be replenished or they can easily get used and take long to form. Other examples of non-renewable resources include; Fossil fuels, forests etc.		**2scores**

	Composition of rocks. - Source of minerals like iron, copper tin, gypsum, lime etc. - Source of soil. - Man activities like mining greatly changes the land scape and this can result into landslides that may affect / kill the miners. - Exhaustion of minerals due to continuous mining this reduces the economy revenue through taxation and also results into replenishing of minerals. **Mitigation.** - Imposing strict laws on mining so as to mine when necessary. - Accepting miners when they are using appropriate personal protective gears. **Benefits of the natural resources.** - Rocks are a source of building materials in the modern construction industry. - Rocks are a source of minerals which can be raw materials for specific industries e.g construction industry to make cement they need lime. - Rocks whether to form soil which is very important to the agricultural industry.		**2scores** **3scores** **3scores** **2scores**
No.6	**ITEM 6** Air preservation is everyone's responsibility. **Category:** Renewable resources are resources which can be replenished for example air, water. **Composition:** Air contains Nitrogen, oxygen, carbondioxide, rare gases, water vapour etc. **Impact of the natural resources.** - Some man activities like burning of fossil fuels, burning of charcoal etc produce greenhouse gases in excess and result into		**3scores** **2scores** **3scores**

	global warming since they absorb and store heat from the sun. **<u>Mitigation</u>** - Increase afforestation to replace cut threes which can absorb excess CO2. - Using catalytic converters in vehicles to convert poisonous gases to harmless ones. Industrialization is another man activity that results into air pollution by producing harmful / poisonous gases/fumes like carbon monoxide, sulphurdioxide etc. **<u>Mitigation.</u>** Setting up strict laws governing waste release from industries to curb the vice of releasing poisonous gases. **<u>Benefits</u>** - Air facilitates respiration during which our food combines with oxygen to produce energy and carbon dioxide. - Air facilitates photosynthesis during which plants make their own food in the presence of carbondioxide, water and sun light. - Air is a raw material for some manufacturing industries like the oxygen producing industries.		**3cores.** **3scores.**

END