WAKISSHA JOINT MOCK EXAMINATIONS
SCORING GUIDE
Uganda Certificate of Education
CHEMISTRY 545/1
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Item 1

S/N	Basis of Assessment	Assessment criteria	score
(a)	Conditions necessary for rusting with reason	- Moisture/water F1 - Air/oxygen F1 - ~~Warmth/temperature~~ damp air. **Reason** ~~Oxygen reacts with Iron, then water.~~	03 Score 2F + 3P = 3
(b)	Properties of either Air/oxygen OR Moisture/ water OR	**Air/ oxygen** ~~- Air is a mixture of gases~~ P1 - Oxygen has no smell P1 - Oxygen has no effect on litmus paper P1 - Air/oxygen is colorless P1 - Oxygen from oxides with other elements. **Water** - It is a colourless liquid - It has no smell. P1 - It has no taste. P1 - Pure water boils at ~~0°C~~ 100°C - Pure water freezes at 0°C - It is a solvent for ionic cpd.	1F + 2P = 2 2F + 1F Any 3 correct 1F + 1P = 2 1F + 0P = 1 2F + 0F = 03
(c)	Uses of either oxygen or water OR	**Oxygen** - It supports burning U - For respiration/ breathing. U - In hospitals to save life. U - For welding operations. U - When swimming for breathing. **Water** - Domestic use. U - Watering crops/plant growth. U - Cooling in industries. U - Means of transport U	Score 4+ → 3 2-3 → 2 1 → 1 Any 3 correct 03
(d)	Impact of rust/brown coat and mitigation	**Impact** - make tools weak and blunt reducing their work rate. I E - make tools look less attractive. due to the rust I E Mitigation - Oiling/greasing the tools on the surface M - Keep tools in dry cool place by painting M - painting	Any 1 correct 01 IEm → 3 IE/Em/Im → 2 Any 1 correct 01 I/E/m → 1

(IEm) I – Impact
E – Explanation.
m – mitigation.

09

Item 2

S/N	Basis of Assessment	Assessment Criteria	Score
(a)	Types of products	- Soapy detergents; white star OR - ~~Soapless~~ detergent: omom magic.	02
(b)	Function/how does soap or detergent work	- Soap molecule has water soluble end and fat/oil/ grease soluble end. - Oil/grease soluble end surrounds the oil/grease spot on cloth, remove it to suspend in water. - Water soluble end dissolves in water. - The cloth is then rinsed about two times in clean water and spread to dry. OR Detergent which work in the same way as soap.	07
(c)	Side effects / danger of using soap/detergent.	- Soap/detergent water through running water taken to water bodies forms a layer on the surface which prevents entry of oxygen and sunlight. Proper disposal of detergents This leads to suffocation of aquatic organisms and death of plant species.	01
(d)	Similarity and difference	**Similarity** Both soap and detergent are used for cleaning purpose. Both have hydrophilic and hydrophobic ends **Difference** - Soap forms scum with hard water while detergent does not form scum with hard water. - Soap does not contain sulphates while detergents contain sulphates etc.	01 Any 1 correct 01 07

Item 3

S/N	Basis of Assessment	Assessment Criteria	Score.
(a)	Raw materials and process of production of Ammonia gas	**Materials** - Nitrogen - Hydrogen **Production** Nitrogen is obtained by fractional distillation of liquid air and hydrogen from natural gas At high temperature and pressure, Nitrogen reacts with nitrogen in the harber process to form Ammonia gas in the presence of finely divided iron as a catalyst. $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ Ammonia is mixed with excess air, purified and passed over platinum at 700°C to form nitrogen monoxide and steam The gases are cooled and mixed with more air to form nitrogen dioxide	02 03

Rm – raw materials
cp – chemical reaction
Rv – Reaction vessel
Pr – Purification
Cd – desired product
Ch – catalyst

- Nitrogen dioxide in then absorbed in hot water Rm in presence of excess oxygen to form nitric acid in the absorption chamber Rx. Cp
- Nitric acid is reacted with concentrated ammonia to form ammonium nitrate Cd

(b)	Production of ammonium nitrate fertilizer OR production of urea fertilizer OR production of Ammonium sulphate fertilizer.	Concentrated nitric acid and ammonia gas are then mixed together in a tank at a temperature of 100^0C-180^0C to form Ammonium nitrate fertilizer $NH_{3(g)} + HNO_{3(l)} \longrightarrow NH_4NO_3$ Ammonia is reacted with carbon dioxide at high pressure to form ammonium carbonate which undergoes dehydration to form urea. $2NH_{3(g)} + H_2SO_{4(l)} \longrightarrow (NH_4)SO_{4(S)}$ Ammonia is reacted with concentrated sulphuric acid to form Ammonium sulphate fertilizer.	03
(c)	Side effect and mitigation	- Pollution of air leading to respiratory complication. - Pollution of water which can poison acquatic organisms. - Being acidic fertilizer, can burn the hands of the workers. **Mitigation** - Wear gloves, face masks. - Wear laboratory coat while in factory. - Install septic tank for waste water.	Any 1 correct 01 Any 1 correct 01
(d)	Social benefits	- Employment opportunities for the community members. - Improved crop yield. - Improved standard of living. - Boots government revenue.	Any 3 correct 03

DEM
D - Danger
E - Explanation
M - Mitigation

BEI
B - Benefit
E - effect of the benefit
I - Impact

Item 4

S/N	Basis of Assessment	Assessment Criteria	Score
(a)	Raw materials	- Copper pyrite - Air - Silica	If copper pyrite only awards 02 still 02
(b)	Process of extraction of copper from the ore and purification	- Improve copper is obtained by roasting copper pyrite with silica and air in a furnace. - The impure copper is then purified by electrolysis using copper (II) sulphate as an electrolyte. - The impure copper is made of the anode while the pure copper electrode as the cathode. Reaction at the Anode $Cu(s) \rightarrow Cu^{2+}(aq) + 2e^-$ Reaction at the cathode $Cu^{2+}(aq) + 2e^- \rightarrow Cu(s)$ Then pure copper is obtained as cathode.	07

(c)	Side effects and mitigation	- Pollution of air leads to respiratory complication. - Pollution of water making it not safe for consumption. - Falling of solid particles on the bodies of workers. **Mitigation** - Wear overall clothes - Use head covering in industry. - Wear face mask.	Any 1 correct 01 Any 1 correct 01
(d)	Social benefits	- Employment opportunities. - Improved standard of living. - Increase government revenue. - Copper is used to make electric cables, coils and construction of electric vehicles.	Any 3 correct 03

Item 5

S/N	Basis of Assessment	Assessment Criteria	Score.
(a)	Definition of climate change	Climate change is the long-term shift in weather patterns and temperature around the world.	01
(b)	Causes of climate change	- Cutting down of trees. - Industries producing goods. - Burning of fossil fuel. - Severe storms. - Emission of greenhouse gases.	Any 3 correct 03
(c)	Side effects of climate change	- Acidic gases like CO_2 causes acid rain which destroys crops. - Burning of plastics releases gases such as SO_2, H_2S which causes respiratory problems. - Burning of fossil fuels release gases which pollute air. **Mitigation** - Use of catalytic converters to convert poisonous fumes to harmless fumes. - Recycling of plastic instead of burning. - Afforestation - Use of alternative energy source like solar power.	Any 2 correct 02 Any 2 correct 02
(d)	Social benefits	- Afforestation leads to convectional rainfall which boots agriculture. - Recycling of plastics keeps soil structure well. - Afforestation creates employment opportunities. - Forests absorb CO_2 which stop acid rain enabling good crop yield.	Any 3 correct
			03

Item 6

S/N	Basis of Assessment	Assessment criteria	Score.
(a)	Definition of a rock	A rock is a natural resource which consists of minerals.	01
(b)	Types of rocks and their formation	- Igneous rock formed when Magama from Earth's crust solidifies on the Earth's surface. - Sedimentary rocks are formed when igneous rocks are weathered to form sediments. The sediments are eroded, deposited and cemented to form sedimentary rocks. - Metamorphic rock formed when both sedimentary and igneous rocks are exposed to high pressure and temperature.	03
(c)	Uses of rocks (social benefits)	- For extraction of some metals. - Road surfacing. - Construction of bridges & culvets. - For decorating - For making paint. - For proving building materials. - Breaking rocks for selling.	Any 5 correct 05
(d)	Side effects and mitigation	- Pollution of air and water due to dust. - Water in craters as breeding place for mosquitoes. - Leads to malaria. - Destruction of animal and plant species due to falling of weak or loosely attached rocks. - Sound pollution. **<u>Mitigations</u>** - Plant trees around rocks - Drain stagnant water. - Fence off the area. - Covers the cracks early before widening.	Any 2 correct 02 Any 2 correct 02

END

Item 6

Rocks are non-renewable natural resources. They can not be replaced when depleted. Rocks are composed of minerals like Aluminium, Iron, Calcium Carbonate. (2)

Stone quarrying involves breaking down of rocks for other uses like construction. This leads to water contamination by quarry residues washed down by erosion to the streams. This can be mitigated by land refilling of quarried areas.

Rocks are used for construction of houses/ aggregates are mixed with sand, cement and water to form concrete.

Titles — Fills to score

CRE, Co-composition } 4+ → 03

2-3 — 2-3 → 02

01 — 1 → 01

(03)

HEM — 3

HE/Em/Hm — 02

Hf/nE/m — 01.

(03)

(08)

Other Hence.

Air pollution - machines produce noise which cause air pollution. This can be mitigate by using machines with silencers -

→ Cows
→ Land.
→ Trees
→ Schools
→ Coffee & matoke.