

RWENZORI REGION SESEMAT
END OF YEAR EXAMINATION 2024
S.3 CHEMISTRY
SCORING GUIDE

PAGE NO.:

DATE: / /

Item 1

a) Soapy detergent ✓^{C_i}

c_i - category identified

b) Soap contains two parts; the hydrophilic part ✓^w
water loving part / polar end and the hydrophobic
part / water hating / non polar end.

w - working

During washing the hydrophilic end is soluble
in water and dissolves in it while the
hydrophobic end is attracted to the dirt / oil /
grease. This lowers the surface tension
between the water and the dirt.

$$\frac{3}{4} \times 2 =$$

$$= \frac{3}{4} \times 8 =$$

$$= 6w$$

Award F=1 for answer
who has 6w and above

On agitation / scrubbing the dirt is
emulsified ✓^w and carried away by the water.
The dirt is then removed by rinsing ✓^w

$$T = C_i + F$$

$$= 1H1$$

$$= 2$$

c) Soap contains chemicals which can cause
skin burns ✓^{D_i} and hence cause pain or even
result in to ~~cause~~ cancer ✓^F

$$D = D_i + F + M$$

$$D = 3$$

This can be mitigated by washing the body
part in contact with soap using clean water.
(OR EQUIVALENT)

d) Both soapy and soapless detergents are effective
when washing using soft water
but I advise this home to use a soapless

s - similarity

D_i - difference

detergent because it does not form scum
with hard water while hard water forms
scum

$$F = S + D_i$$

$$F = 2$$

(OR EQUIVALENT)

Item 2

- g) Metal \checkmark loses electrons in outer shell to form the metal ion (cation) positively charged ion and the delocalized electrons e.g. aluminium \checkmark

C_i - category

R - Reason

F - Example

$$C = C_i + R + F$$

$$C = 3$$

- b) Resistant to corrosion \checkmark

Malleable \checkmark Ductile \checkmark High melting point \checkmark

(OR EQUIVALENT)

b, and c are combined / merged

$$Hf + 1u \times = 3$$

1-3p and 1u

or

3p and 0u

$$X = 2$$

2p and 0u or

1p and 0u or

0p and 1u

$$X = 1$$

No p or No u

$$X = 0$$

- c) Making of utensils such as pans, \checkmark
 Making bicycle / aeroplane parts \checkmark
 (OR EQUIVALENT)

- d) It is non biodegradable and when thrown in the soil it reduces its aeration and causing infertility
 Mitigation

Collect the aluminium parts and recycle \checkmark

$$I = D_i + M$$

$$I = 2$$

item 3

Raw materials ✓ AM

Wastes e.g. animal dung ✓ AM

Water ✓ AM

Process of production

Bio-gas is normally produced by anaerobic action of micro-organisms on the wastes producing gases such as ammonia, methane, carbon dioxide, hydrogen sulphide, nitrogen ✓ Pi

The wastes are collected and mixed with a specific proportion of water in a bucket / container ✓

The mixture is put into a tank or chamber where bacteria break down the organic substances like carbohydrates, proteins and fats into sugars, amino acids and fatty acids ✓ Pi

The sugars, amino acids and fatty acids are then passed into an anaerobic chamber where micro-organisms convert them into carbon dioxide, nitrogen, hydrogen sulphide, methane and ammonia ✓

These gases make up biogas which is used for cooking and lighting ✓ Ch

The residue bio-slurry is used as fertilizer

Side effects

The gases may escape to the atmosphere and pollute the environment for example carbon dioxide is a green house gas which causes global warming ✓ E (OR EQUIVALENT)

Mitigation:

Constant inspection of containers to check any holes in them. (OR EQUIVALENT) ✓ M

RM - raw materials

V - vessel

Pi - Physical / chemical process

cd - conversion to desired product

ch - coherence

cp - complete process

Pr = purification (if any)

CP = 3Pi + Pr

P = 3 if learner gives all RM and V, cp, cd, ch

P = 2 if learner gives 1 RM and any three of V, cp, cd, ch

P = 1, for 1 RM and any 1 of V, CP, cd, ch

P = 0 for NO RM

No, V, cp, cd, ch

S = Di + ETM

S = 3

S = 2 for Di + E or Di + M
or ETM only given

S = 1 for Di or E or M
only given

S = 0, if none is given

Social benefit

85

$\beta_i = \text{social}$

People will get employment opportunities, hence increased income and improved standards of living.

benefit

E = Effect of

benefit

I = impact of

the benefit

$$B = B_c + E + J$$

B = 3

$$B = 2 \text{ for}$$

B_C+F or B_I+I or
E+I only quick

$$B = 1$$

For Bi, I or F
only quick

$B = 0$ if no $B_i, I \in$

1960-1961

and the formation of what has

Raw materials

Cassava ✓ RM

Water ✓ RM

Malt ✓ RM

Yeast ✓ RM

P = 3

if teacher has

all RM and all

v, cp, cd, ch, pr

Process of production

Alcohol is prepared by fermentation process.

Cassava is crushed ^{Pi} and treated ^{Li} in steam under pressure to extract starch in drumsStarch is treated with malt ^{Pi} (partially sprouted malt barley) for an hour at ~~60°C~~60°C. Malt supplies an enzyme diastase which hydrolyses ^{Pi} starch to sugar, maltoseYeast is then added at room temperature and one of its enzymes, maltase catalyses the hydrolysis ^{Pi} of maltose to glucose. ^{Pi}

Glucose is then decomposed to ethanol by another enzyme zymase in yeast

The resulting solution is crude ethanol which is converted to pure ethanol by fractional distillation ^{Pi} ~~water~~

P = 2

if teacher has

1 RM and any three

of v, cp, cd, ch, pr

P = 1

if teacher has

1 RM and any 1 of

v, cp, cd, ch, pr

P = 0 for no RM

no v, cp

cd, ch

pr

Side effects.

The solid residues when poorly handled pollute the soil and water bodies killing the organism in soil and water.

Ingestion

Proper disposal of the solid residues and can also be used as food for pigs.

S = D_i + E + M

S = 3

(OR EQUIVALENT)

Social Benefits

Government will collect taxes hence increased revenue \checkmark ^B which is used to improve infrastructure \checkmark ^F = 3 like schools, roads, hospitals, and people will easily transport their other produce to get better health services etc \checkmark ^I

(OR EQUIVALENT)

$$B = B_i + F + I$$

Item 5 ✓

Water is renewable natural resource because it can be replaced ✓
composition: Hydrogen and oxygen ✓

N = 3 if learner has C, RE + both components

N = 2 if learner has either C+R or C+B or R+F and 1 component

N = 1 if learner has either C, or F or R and 1 component

N = 0 if learner has no C, RE, no component or has C, RE but no component.

Washing of clothes near lake, causes pouring of detergents in the water and these contain nutrients such as phosphates which cause growth of algae which uses oxygen causing suffocation of the fish (or mitigation) ✓

Sensitize people about dangers of washing near the lake ✓ M

Lakes are habitat for fish which is food and also sold for income ✓ E

OR (EQUIVALENT)

M = H + I + M

M = 3

I - impact of human activity
H - How it occurs
M - mitigation

Bc = Bi + E

Bc = 2

Bi = Benefits of conserving the resource

E = Explanation

ITEM 6 ✓

Fossil fuel is non renewable natural resource
because it can not be replaced when used up

composition: Carbon ✓ and Hydrogen ✓

Burning of fossil fuel produces pollutant gases such as carbon dioxide gas which traps a lot of heat in the atmosphere causing global warming ✓

Mitigation

Using electric vehicles as an alternative to petrol and diesel

Fossil fuels can be used to make other products such as gasoline and water surfacing materials which are environmental friendly ✓

PAGE NO.:
DATE: / /

N = C, RF + compound

N = 3

(check item 5 for details)

M = H + I + M

M = 3

(check item 5 for details)

Be = B_i + E