

TABORA MUNICIPAL COUNCIL
FORM TWO DISTRICT ASSESSMENT
032. CHEMISTRY - MARKING GUIDE

SECTION A (15 MARKS)

Q N	I	II	III	IV	V	VI	VII	VIII	IX	X
ANSW	A	A	B	B	C	B	C	D	D	C

1@ = 10 marks

QUESTION	I	II	III	IV	V
ANSWERS	D	C	G	A	F

1@ = 5 marks.

SECTION B (70 MARKS)

3 c) Importance of states of Matter

- Water cycle
- Refrigeration
- Drying of Materials
- Working of Steam engines
- Extraction and purification of metals
- Refinery
- Separation of Mixtures

Any four (4) points @ 1 mark = 4 marks

3 b) (i) physical change (1 mark)

- (ii) - No change in mass
- No new substance formed
- No energy given out
- Affects only physical properties
(Any four (4) points $\frac{1}{2} @ = 2 \text{ marks}$)

(c) A (Hydrochloric acid), the diagram required is of Corrosive

B (Rat poison), the diagram required is of toxic

c (Petrol), the diagram required is of flammable

(1 @ = 3 marks)

4 a)

Dalton's Atomic Theory	Modern Atomic Theory
i) Atoms can neither be created nor destroyed	Atoms can be created or destroyed or split by means of nuclear reaction
ii) Atoms of the same element are identical, and have the same mass and properties	Some elements have atoms of the more than one kind which differ slightly in mass such atoms are called isotopes
iii) Matter is made up of tiny particles called atoms (Atoms mean unsplitable particles)	An atom is made up of smaller sub-atomic particles called protons, neutrons and electrons

Any two (2) points (1 @ = 2 marks)
2

4 b) Solution

Given element Q

Atomic number = 11

Number of Neutron = 12

(i) Mass number ?

$$\begin{aligned}\text{Mass number} &= \text{Atomic number} + \text{No. of Neutrons} \\ &= 11 + 12 \\ &= 23 \quad (1 \text{ mark})\end{aligned}$$

(ii) Number of protons ?

Number of protons = Atomic number

Hence, Number of protons = 11 (1 mark)

(iii) Number of electrons ?

Number of electrons = Number of protons =
Atomic number

Hence, Number of electrons = 11 (1 mark)

(C) Solution

Given element $^{16}_8\text{P}$ (99.76%), $^{17}_8\text{P}$ (0.04%) and $^{18}_8\text{P}$ (0.20%)
(1 mark)

From

Relative atomic mass of P

$$= \frac{\text{Mass number} \times \text{Percentage given}}{100} \quad (1 \text{ mark})$$

$$\text{RAM} = \left(\frac{16 \times 99.76}{100} \right) + \left(\frac{17 \times 0.04}{100} \right) + \left(\frac{18 \times 0.20}{100} \right) \quad \left(\frac{1}{2} \text{ mark} \right)$$

$$\text{RAM} = \left(\frac{1596.16}{100} \right) + \left(\frac{0.68}{100} \right) + \left(\frac{3.6}{100} \right) \quad \left(\frac{1}{2} \text{ mark} \right)$$

$$RAM = 15.9616 + 0.0068 + 0.036$$

$$R.A.M = 16.0044$$

$$\therefore RAM = 16 \text{ (2marks)}$$

5

a) - Galvanization

- Painting

- Tin plating

- Oiling

- Sacrificial anode

- Use of plastic

- Use of silica gel

(Any four(4) points)

(1@ = 4marks)

b) (i) Problem identification

(ii) Drawing Conclusion

(iii) Data collection and Interpretation (1@ = 5marks)

(iv) Experimentation

(v) Hypothesis formulation

6 a) (i) Renewable source of energy - are those source of energy which are continually being replaced within short period of time

(ii) Biogas - is a gaseous fuel derived from decomposing biological waste

(iii) Water gas - is a mixture of carbon monoxide and hydrogen with small amount of nitrogen, carbon dioxide and methane

(1@ = 3marks)

- 6 (b) (i) solar energy
(ii) Wind energy (0.5 @ = 1.5 mark)
(iii) Biomass

- c) (i) Deforestation
(ii) Air pollution
(iii) Soil erosion (1 @ = 4 marks)
(iv) Loss of wildlife habitat
(v) It cause drought
(Any four (4) points)

- 7 a) (i) Area D
(ii) Area A
(iii) Area B (0.5 @ = 2 marks)
(iv) Area C

(b)

Element	Period	Group	Electron Configuration
Calcium	4	II	2: 8: 8: 2
Sulphur	3	VI	2: 8: 6
Chlorine	3	VII	2: 8: 7
Helium	1	VIII	2
Neon	2	VIII	2: 8

(c) Helium and Neon (1 mark) (0.5 @ = 7.5 marks)

Reasons

- (i) Both are noble gases found in group VIII
(ii) Both are stable (have full filled outermost shell)
1 @ = 2 marks

8 a) Gas X is Oxygen (1 mark)

b) - Hydrogen Peroxide (1 mark)

c) Required diagram for preparation of Oxygen
(Drawing 2 marks
labelling 4 marks)

d) Hydrogen peroxide $\xrightarrow{\text{Manganese(IV) Oxide}}$ water + Oxygen gas
(2 marks)

9 a)

Candle (Luminous)	Gas stove (Non-luminous)
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i) Yellow in colour

Blue in colour

ii) Produces soot

Does not produce soot

iii) Produce less heat

Produces more heat

iv) Has four zones

Has three zones

v) Burns quietly

Burns with roaring sound

vi) Has irregular shape

Has regular shape

(Any four (4) points @ = 1 mark = 4 marks)

b) (i) It is bright

(ii) It is not very hot
(1 @ = 2 marks)

c) Luminous flame is produced when air hole of bunsen burner closed while Non-luminous flame is produced when air hole of bunsen burner is full open

(2 @ = 4 marks)

SECTION C: (15 marks)

10

a) (i) Valency is the ability of an atom of given element to combine with other while oxidation state is total number of electrons that an atom gains or loses in order to form a chemical bond with another atom (1 mark)

(ii) Empirical formula is the formula which represents the simplest ratio of the atoms or ions in a compound while molecular formula is the formula which show the actual number of each atom in a molecule (1 mark)

b) (i) Al_2O_3

(ii) N_2O_5

(iii) CO_2

(iv) $CaCO_3$

(v) $NaCl$

(1 @ = 5 marks)

c) Solution

Data given

C = 26.70%, H = 2.20%, O = ?

$$\begin{aligned}\% \text{ of O} &= 100\% - (26\% \text{ C} + 2.20\% \text{ H}) \\ &= 71.1\% \quad \left(\frac{1}{2} \text{ mark}\right)\end{aligned}$$

Element	C	H	O
% Composition	26.70	2.20	71.7
R.A.M	12	1	16
Divide % Composition by R.A.M	$\frac{26.70}{12}$ $= 2.225$	$\frac{2.20}{1}$ $= 2.20$	$\frac{71.1}{16}$ $= 4.443$
Divided by smallest value	$\frac{2.225}{2.20}$ $= 1.01$	$\frac{2.20}{2.20}$ $= 1$	$\frac{4.443}{2.20}$ $= 2.02$
Simplest ratio	1	1	2

(4 marks)



Empirical formula = CHO_2 ($\frac{1}{2}$ mark)

Then,

Calculate the Molecular formula

Molecular formula = (Empirical formula) $_n$

Given Vapour density 45

Then weight = Vapour density $\times 2$

$$= 45 \times 2$$

$$= 90 \quad (\frac{1}{2} \text{ mark})$$

$$(\text{Empirical formula})_n = 90$$

$$(CHO_2)_n = 90$$

$$(12 + 1 + 16 \times 2)n = 90$$

$$(13 + 32)n = 90$$

$$\frac{45n}{45} = \frac{90}{45}$$

$$n = 2 \left(0\frac{1}{2} \text{ mark}\right)$$

Then

$$\text{Molecular formula} = (\text{Empirical formula})n$$

$$= (\text{CH}_2\text{O}) \times 2$$

$$= \text{C}_2\text{H}_2\text{O}_4$$

$$\therefore \text{Molecular formula} = \text{C}_2\text{H}_2\text{O}_4$$

(2 marks)