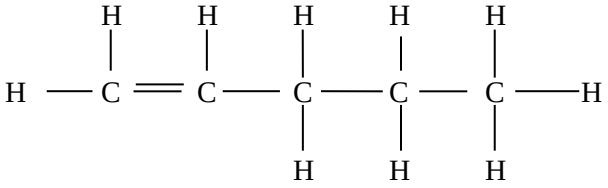
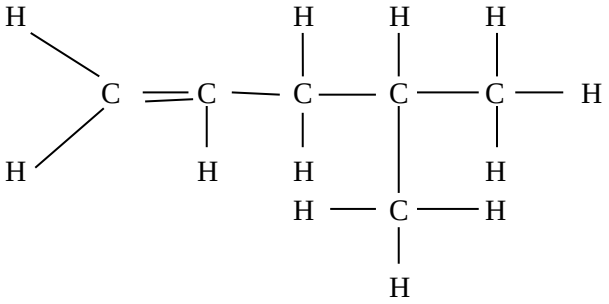
PAPER 1- MARKING SCHEME

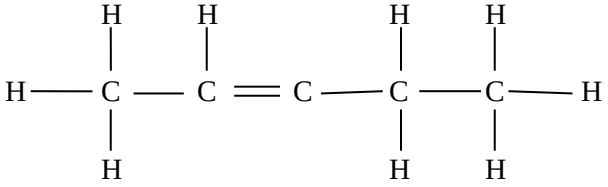
1.
   a) Deliquescent – a substance that absorbs water from the atmosphere and changes into a solution
      Hygroscopic – substance that absorbs water from the atmosphere but just becomes wet
   b) Drying agent used to test for water.
2.
   a) i) element
      -substance that cannot be split into simple substance by chemical means OR
      -substance that consists of one type of atoms.
      -A pure form of a substance with a unique atomic number.
      ii) Atomic number
      -Number of protons in an atom (Rej: number of electrons
   b) $Ti_2(SO_4)_3$ OR $T_2(SO_4)_3$
3. B
   a) Ductility / ductile
   b) Activation energy
   c) Vander Waals force (Rej; intermolecular force)
   4.



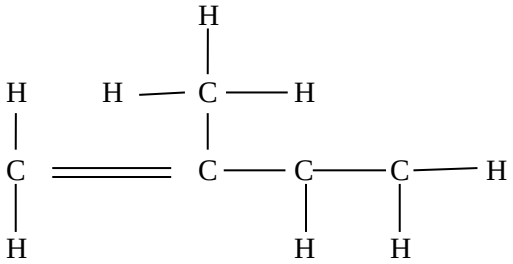
Pent-1-ene



2- Methylbut-1-ene



Pent – 2 - ene



2-Methlybut-2-ene

5. Heat the hydrate salt in a sealed container. The pink substance changes to blue. Allow the blue substance to cool. It changes to a pink substance. Heat the hydrated salt. Pink substance changes to blue content vapour and cool. Ad

6.

a) $Al_2O_{3(s)} + 6HCl_{(aq)} \longrightarrow 2AlCl_{3(aq)} + 3H_2O_{(l)}$

b) $Al_2O_3 = 2(27) + 3(16) = 102$ Moles of $Al_2O_3 = \frac{153}{102} = 1.5mol$

Moles of HCl = $\frac{153}{102}$ x 6 = 9 moles

7. Answer in the Question

8.

a) $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$ $\frac{1.0 \times 10^7 \times 1}{77} = \frac{1.0 \times 10^5 \times V_2}{298}$

$V_2 = \frac{1.0 \times 10^7 \times 298}{1.0 \times 10^5 \times 77}$ $V_2 = 387.0dm^3$

b) k

No of moles $N_2 = \frac{387.0}{24.0} = 16.1$ moles

Mass of N_2 = 16.1 x 28 = 451.50g

9.

a) $^{14}_{6}C \quad ^{14}_{6}N + {}^{0}_{-1}e$

b) i) 5.6×10^3 yrs $(5.6 - 5.7) \times 10^3$

ii) 78% - or + 0.4

10.

a) Enthalpy of formation of hydrogen peroxide or enthalpy of formation

b) $\Delta H_1 + \Delta H_3 = \Delta H_2 \Longrightarrow \Delta H_2 = \Delta H_2 - \Delta H_1$

= - 285.8 – (-187.8) = 187.8 – 285.8 = - 98 $kJmol^{-1}$

11. .

a) Iron(II) sulphide or conc sulphide / copper sulphide (Accpt. formula: Fes/ HCl)
Hydrochloric acid or lead (II) sulphide/ HNO_3

b) Hydrogen sulphide
The sulphur changes from -2 to 3 ero/(it reduces SO_2 to S) i.e. +4 to 0 / sulphur lost e's in the H_2S to form sulphur.

c) Vulcanization of rubber
Manufacture of sulphur drugs
Manufacture of gun powder/ match sticks / explosives/ fungicides

12. .

a) $CU^{2+}_{(aq)} + Fe_{(s)} \quad Cu_{(s)} + Fe^{2+}_{(aq)}$

c) $\Delta H = MC\Delta T$; = 75.0 x 4.2 x 5.6 = - 1764.5

Moles of Cu = $\frac{5.83}{63.5}$ = 0.0918

$\Delta H/mol = \frac{1764}{0.0918}$ = -19215J (must have a –ve sign)

= - 19.2$kJmol^{-1}$

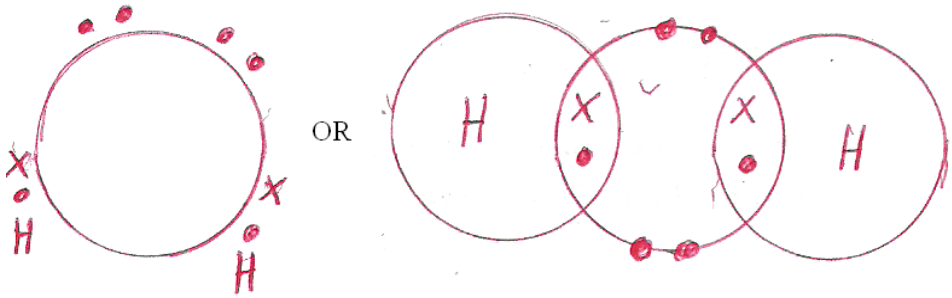
13. .

a) Margarine
Reagents – hydrogen /H_2
Condition – high temperature 150 – 250^0C (range must be given)

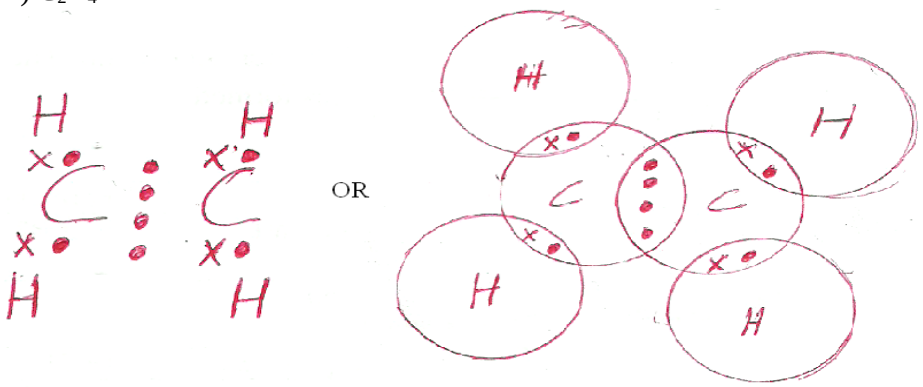
b) Soap
Reagent – sodium hydroxide / NaOH **or** potassium hydroxide
Condition – heating (Rej; warming to temperature e.g. 50^0C

14.

a) i) H_2O



ii) C_2H_4



b) Dative covalent bond / dative / co-ordinate.

15. .

a) Gas has no colour and smell/ odorless.

b) CO_2 has high affinity for O_2 in the hemoglobin in the blood/ or displaces oxygen from haemoglobin. Therefore the body tissue are deprived of oxygen. Combines to for, carboxyhaemoglobine

16. .

a) Calcium

Add a few of NaOH to an aqueous solution fertilizer. It forms white ppt insoluble in excess.
Add a few drops of aqueous sulphuric acid to another white ppt portion of aqueous solution of fertilizer. Forms a white ppt insoluble in excess.

b) Ammonium ions

Heat the sample fertilizer in a test tube and test gas evolved with dump red litmus paper, it turns blue. OR
Add NaOH to the sample fertilizer and heat the mixture, test gas evolved using damp red litmus paper, turns blue or introduce a glass rod dipped in conc HCl, white fumes observed.

17. .

a)

C	H	O
69.42	4.13	26.24
$\frac{69.42}{12} = 5.785$	$\frac{4.13}{1} = 4.13$	$\frac{26.24}{16} = 1.653$
$\frac{5.785}{1.653} = 3.5$	$\frac{4.13}{1.653} = 2.5$	$\frac{1.653}{1.653} = 1$
7	5	2

Empirical formula $C_7H_5O_2$

b) E.F.M = 7(12) + 5 (1) + 2(16) = 121

$(C_7H_5O_2)_n = 242$ $n = \frac{242}{121} = 2$

Molecular formula is $C_{14}H_{10}O_4$

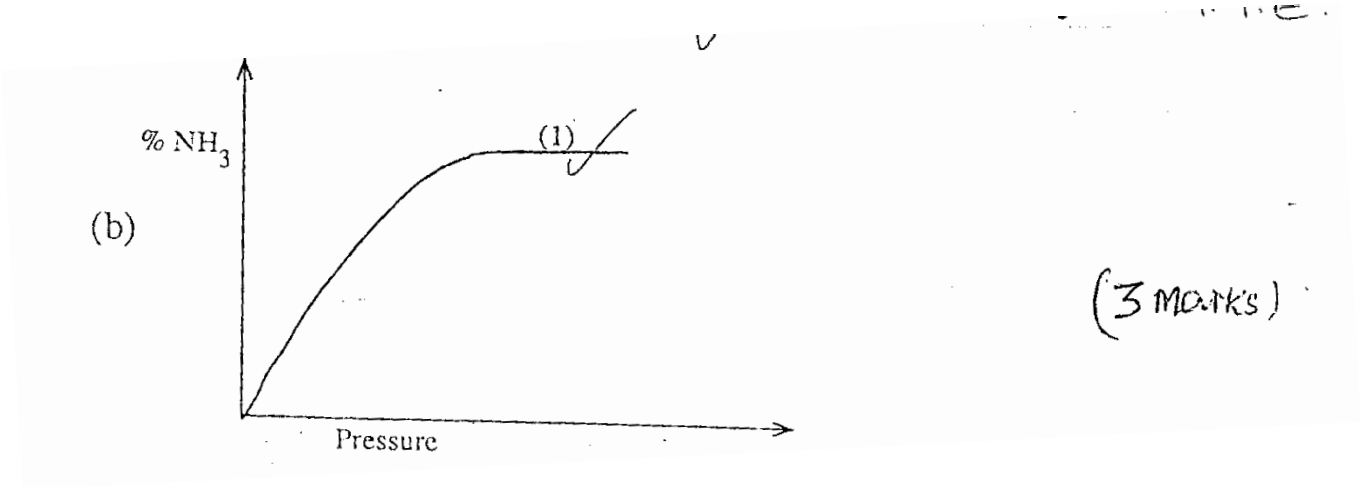
18.
a) Hydrogen gas
b) Increase the surface area for faster reaction
c) – picking of metals
- Making of drugs
- Regulation of pH in the beer industry
- Treatment of sewage

19. .
a) $2H_{2(g)} + O_{2(g)} \rightleftharpoons 2H_2O_{(l)}$
b) E.m.f = 0.40 - - 0.83 = 1.23 per cell
For ten cells = 10 x 1.23 = 12.3
c) Water formed can be used
Water is not a pollutant
Don't remove harmful wastes

20. .
a) $NH_4NO_{3(s)}$ $N_2O_{(g)} + 2H_2O_{(g)/(l)}$
b) Downward displacement of warm water because it fairly soluble in cold water.
c) Both red and blue litmus will not change colour
(Rej; no observation made on paper)
(Acc: no observable change on paper)

21. .
a) Chlorofluorocarbon
b) When ozone is depicted, high energy UV radiation reach the earth, which ,may cause skin cancer to human beings.
c) Global warming/ green house effect(Rej: acid rain

22. .
a) Forward reaction is exothermic, therefore increase in temperature shifts position of equilibrium to the left direction in which heat is absorbed



b) Answer on the question

23. HCl is a strong acid which is fully ionized in water while ethanoic acid s a weak acid partially ionized in water.

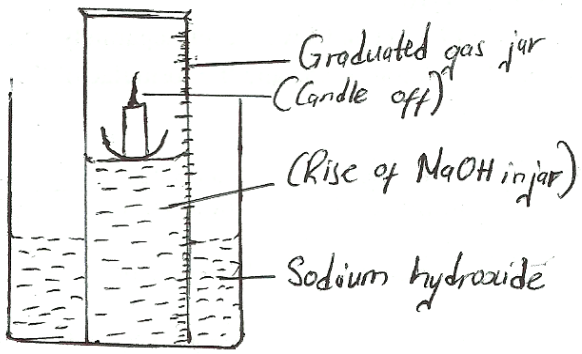
24. React iron metal with sulphuric acid to form iron (II) sulphate. React aqueous ammonia with sulphuric acid to form Ammonium Sulphate. Mix the two solutions, Iron (II) sulphate and ammonium sulphate to form a solution of ammonium iron (II) sulphate. Heat/evaporate, until crystallization starts then cool, filter. Add excess H_2SO_4 to iron metal to form $FeSO_4$. Add aqueous NH_3 to form NH_4SO_4. The two salts in SO react to

form ammonium iron (II) sulphate. Evaporate until crystallization starts. Cool and filter to obtain ammonium Iron (II) sulphate.

25. .

Test	Observation	Inference
To the first portion, $1cm^3$ of soap solution was added	No lather formed	Water hard containing Mg^{2+} / Ca^{2+} ions
The second portion was boiled, cooled and $1cm^3$ of soap solution was added	No lather formed	Permanent hardness of water
To the third portion, $3cm^3$ of aqueous sodium carbonate was added, the mixture filtered and $1cm^3$ of soap solution added to the filtrate.	Lather formed immediately	Na_2CO_3 removed the hardness. Water was soft. Mg^{2+}/Ca^{2+} absent. Mg^{2+} / Ca^{2+} are ppted out.

26.



27. .

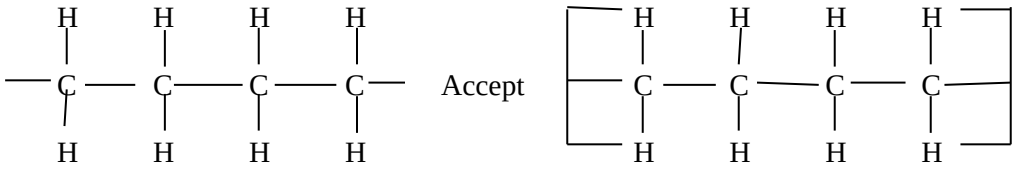
a) 2,8,8 / 2.8.8

b) $K^+ < 5^{2-} < P^{3-}$

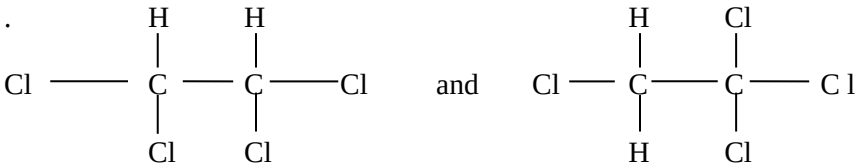
Potassium has 19 protons attracting 18e's, sulphur has 16 protons attracting 18e's and phosphorus has 15 protons attracting 18e's. therefore the electrons in potassium ions are attracted more strongly making it the smallest ion.

PAPER 2 - MARKING SCHEME

1. .
   a) Copper chloride
      Ammonia
      They form ions when they dissolve in water. The ions conduct electricity.
   b) i) must be on the wire or metal rod
      ii) Potassium/ sodium Nitrate
      Chloride
      Sulphate
   c) i) To prevent it from rusting
      To improve its appearance
      To prevent conversion
      To give it shiny appearance.
      ii)
      $Q = it$
      $= \frac{0.5 \times 60 \times 60}{96900}$
      $= 2.01\ g$
2. .
   a) i) 2.2 demethylpropane
      ii) Pent-2-yne
   b) Add acidified potassium manganate vii or bromine water to each of the compound in separate test tube 2.2 dinathypropane decolourise while pent-2-yne decolourises them.
   c) i) L – Ethylethanorite
      N – Ethane
      ii)



      iii) Reagent = water
      iv) (I) Esterification / condensation
      (II) Substitution
   d) .



3. .
   a) i) Metallic bonds in S are stronger than in R
      ii) V is monoatomic while U is diatomic
      The Van der Waals force in v are weaker than in U
   b) W reacts more vigorously
      It is easier to lose the odur/valence electrons in W than in T
      W is more electropositive than R
      Reactivating of groups elements. Increases down the group
   c) $4T_{(s)} + 5O_{2(g)} \longrightarrow 2T_2O_{5(g)}$
      $4P_{(s)} + 5O_{2(g)} \longrightarrow 2P_2O_5$

d) $2R_{(s)} + 2H_2O_{(l)} \quad 2ROH_{(aq)} + H_{2(g)}$

Moles of gas = $\frac{600}{24000}$ = 0.025 moles

Moles of R = 2 x 0.025

= 0.05moles

RAM = $\frac{1.15}{0.09}$ = 23

e) Used in florescent bulbs / lamps

Used in arc welding

Used in fire extinguishers

Used as a preservative in museum

4. .

a) i) C, copper A,B

B is the most reactive because it has highest ΔT

C is the least reactive because it can not displace ions of copper from solution.

A is more reactive than copper because it displaces Cu^{2+} from solution.

ii)

Blue colour of the solution fades/ disappeared.

Black deposit is formed.

b) i) $C_{(s)} + 2H_{2(g)} + ½ O_{2(g)} \longrightarrow CH_3OH_{(g)} \quad \Delta H = 239kJmol^{-1}$

ii)

(I) Yield increases

Equilibrium shifts to the right

(II) .

iii) Enthalpy of formation of CO was not included.

5. .

a) i)

(I) **Mistake**- method of gas collection is wrong

Reason – ammonia is less dense than air

(II) **Mistake** – Flash should be slanting downwards left to right

Reason – water produced may run back and brake the flask

(III) **Mistake –** moist reactants should not be used

Reason – ammonia gas will dissolved in water.

ii) Calcium oxide

iii) $2NH_4Cl_{(g)} + Ca(OH)_{2(g)} \longrightarrow 2NH_{3(g)} + 2H_2O + CaCl_2$

It s reactions are (aq) $CaCl_2$ should (aq)

iv) Deep a glass rod in conc. HCl and bring it into contact with ammonia in a test tube. It forms a white fume.

b) i) Unit I

ii) **A** – nitrogen II oxide (NO)

B – Nitrogen IV oxide (NO_2)

iii) Nitrogen in NH, has an oxidation state of -3 while in HNO, it has oxidation state of +5.

Increase in oxidation state is oxidation.

iv) $NH_{3(g)} + HNO_{3(aq)} \quad NH_4NO_{3(aq)}$

molar mass of NH_4NO_3 = 80

molar of $NH_4NO_3 = \frac{1000 \times 1000}{80}$

molar ratio = 1 : 1

molar mass of HNO_3 = 63

mass of $HNO_3 = \frac{1000 \times 1000 \times 63}{80}$

6. .

a) i) ZnS

ii) So as to obtain ZnO which is easily reduced by CO to Zn

$2ZnS_{(s)} + 3O_{2(g)} \longrightarrow 2ZnO_{(g)} + 2SO_{2(g)}$

b) i) coke

Limestone

ii) $2C_{(s)} + O_{2(g)} \longrightarrow 2CO_{(g)}$

$CO_{2(g)} + C_{(s)} \longrightarrow 2CO_{(g)}$

Rej ; $C_{(s)} + O_{2(g)} \longrightarrow CO_{2\,(g)}$

iii) vapour / gaseous state. The temperature is above boiling point of Zinc

iv) 420 – 906 Temperature is below boiling point of Zinc

v) SO_2 produced is poisonous/ forms acid rain

vi) Making brass

Used as a negative terminal in dry cells

Galvanization of iron

Rej: manufacture of dry cells

7. .

a) i) Curve I

The amount of products is increased or concentration of product is increasing.

ii) **X** – time at which equilibrium is estimated

Y – rate of forward reaction is equal to the rate of reverse reaction OR rate of reaction is constant

b) i) Increasing pressure increases the rate of reaction

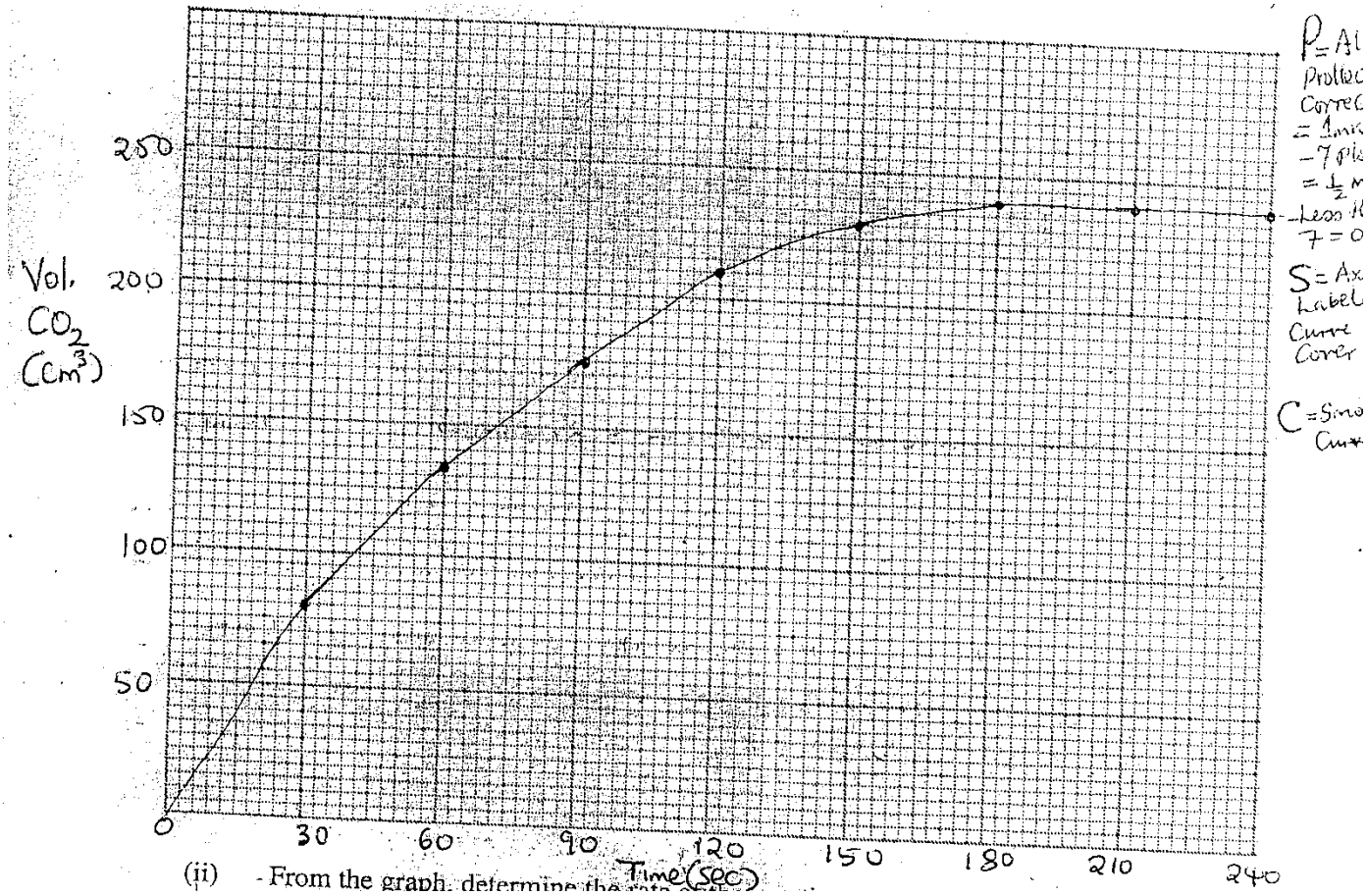
Molecules are closer

There is more collision of gases is molecules

ii) Pressure has no effect

Pressure has no effect on liquid molecules

c)



(ii) - From the graph, determine the rate of ...

ii)

(I) $\frac{40.0}{15.0} = 2.667\ cm^3/s$

(II) $\frac{240 - 160}{150 - 66} = \frac{80}{86} = 0.947 cm^3/s$

(III) Value at 15 sec is higher than value at 120 seconds
Amount of CO_2 is increasing with time.

PAPER 3 – MARKING SCHEME

1 **Table 1**

a) Complete table..... 1mk

Conditions

i) Complete table with 3 titration done..... 1mk
ii) Incomplete table with 2 titrons done ..... 1/2 mk
iii) Incomplete table with only 1 titration done.... 0 mk

Penalties

- Wrong arithmetic/subtraction
- Inverted table
- Burette reading beyond 50cm3 unless explained
- Unrealistic titre(s) i.e. to small (below 1.0cm3 or too high (100s)

NB: Penalise 1/2mk for each to a max. Penalty of 1/2mk (i.e. Penalise 1/2mk ONCE)

b) Use of decimals.....1 mk
(Tied to 1st and 2nd rows each)

Conditions

i) Accept either 1 or 2 d.p used sensitizing otherwise Penalise fully.
ii) If 2 d.p are used the 2 dp must be a "0" or "5" otherwise penalatise fully.
iii) Accept incosntistency of zero as initial burette reading i.e 0.0

c) Accuracy..... 1mk

Compare the candidate titre values with the S.V tick the chosen value where it earns a mark NB: The S.V is the teacher 'Average Titre".

i) If at least One value is within $\pm$ 0.1cm^3 of s.V ..... 1 mk
ii) If no value is within $\pm$ 0.3cm^3 for at least ONE is written $\pm$.0 of the SV.....$^1/_2$mk
iii) If no value is within $\pm$ 0.2cm^3 of the SV.... O mk

Compare the SV with the worked out "CORRECT TITRE" and award accordingly.

d) Principle of Averaging..... 1 mk

Conditions

i) If 3 consistent values are averages..... 1mk
ii) If 3 titrations are done but only 2 are consistent and averaged ..... 1 mk
iii) If only 2 titrations are done are consistent and are averages.... 1mk
iv) If 3 are possible but only 2 are averaged ....0 mk
v) If 3 titrations are done are in consistent and averaged..... 0 mk

Penalties

i) Penalise 1/2mk for wrong arithmetic if the errors is outside +2 units in the 2nd d.p
ii) Penalise 1/2mk if no working is shown but the answer is correct.
iii) If no working is shown but answer given is wrong, penaltise fully.
iv) Accept eounding off of answer to 2 d.p otherwise penalize 1/2mk for rounding off to 1 dp or whole number.

NOTE: i) Accept "Answering it works out exactly to 1 d.p or to a whole number.

ii) Section (i) Must be marked for the 'mark' for averaging is awarded in table 1.

e) Final answer..... 1mk
compare the candidates CORRECT average titre with the SV.

i) If within $\pm$ 0.1cm^3 of the SV..... 1mk

ii) If within $\pm$ 0.2cm^3 of the SV.....1/2mk

iii) If beyond $\pm$ 0.2cm^3 of the SV....0 mk

NOTE: i) Incase there was wrong arithmetic/substraction in the table, use the correct values in averaging for the final answer.

ii) Where there are two possible average titres use the value which gives the candidate max. credit

iii) If wrong values are averaged, pick the correct values (if nay) following the principles of averaging, a average and award accordingly.

Eg. 1 SV = 15.80cm^3

Candidates values are 15.4cm^3, 15.6cm^3, 15.8cm^3

Candidates working

Either

$\frac{15.4 + 15.6 + 15.8}{3}$ = 15.60cm^3 x (0 mk)

OR

$\frac{15.4 + 15.6}{2}$ = 15.5cm^3 (0 mk)

Examiner to pick = $\frac{15.6 + 15.8}{2}$ = 15.7cm3 (1 mk)

2 S.V = 15.50cm^3

Candidate's values are 15.8, 15.6, 15.6

Candidate looking

$\frac{15.6 + 15.6}{2}$ = 15.6cm^3

Examiner to pick $\frac{15.8 + 15.6 + 15.6}{3}$ = 15.67cm^3

and award $^1/_2$mk

3. S.V = 15.90cm^3

Candidate's values are 15.0, 15.8, 15.6

Candidate's working

$\frac{15.8 + 15.6}{2}$ = 15.70cm^3

Examiner to pick = $\frac{16.0 + 15.8}{2}$ = 15.90cm^3

and award 1 mk instead of 1/2mk if the candidate's values are used

CT - 1
D - 1
A - 1
PA - 1
FA - 1
5

CALCULATIONS

11) Moles NaOH in $25cm^3$ of solution B
= $\frac{2 \times 25}{1000}$

Moles of NaOH in $250cm^3$ of solution D
$\frac{2 \times 25}{1000}$
Have conc of solution D = $\frac{2 \times 25}{1000} \times \frac{100}{250}$
= $0.200\ Mol^{-1}$

OR
Conc. of solution D = $\frac{2 \times 25}{1000} \times \frac{1000}{250}$
= $0.200\ Mol^{-1}$
OR $M_cV_c = M_dV_d / M_1V_1 = M_2V_2 / M_BV_B = M_DV_D$
M_d(or M_2 or M_D) = $\frac{2 \times 25}{250}$ ½

OR
Conc of solution D = $\frac{2 \times 1}{10}$
= $0.200\ mol\ L^{-1}\ 1/_2$

Conditions

i) Penalise fully for wrong/strange molarity of solution B (It must be used as given 2M)
ii) Penalise 1/2mk for wrong answer (i.e any "answer other than 0.200m)
iii) Penalise 1/2mk for wrong units used otherwise ignore if units not given.
iv) Accept CORRECT answer even if given to 2 or d.p
v) Penalise fully if WRONG "formula" is used
vi) If correct "Formula is given followed by correct subject creadit a maximum of 1/2mk subject to correct answer)
vii) REJECT 'anwer'given without working being shown.

iii) Moles of NaOH in $25cm^3$ of solution D used
= $\frac{\text{Ans (ii)} \times 25}{1000}$

Moles of alkanoic acid used = $^{1}/_{3}$ x Ans (ii) x $^{25}/_{1000}$

Hence conc of soln C = $^{1}/_{3}$ x $\frac{\text{Ans (ii) x 25}}{1000}$ x $\frac{1000}{\text{Titre}}$

= Correct Ans.

OR

Conc. of soln C = $^{1}/_{3}$ x $\frac{\text{Ans (ii) x 25}}{\text{Titre}}$

OR

M_aV_a = $^{1}/_{3}$ = Ma = $^{1}/_{3}$ x $\frac{\text{Ans (ii) x 25}}{\text{Titre}}$

M_bV_b

= Correct answer

NOTE:

1. Answer led to correct arithmetic otherwise penalise $^{1}/_{2}$ mk for arithmetic error.
   Outside $\pm$ 2 units in the 2nd d.p
2. Penalise 1/2mk for wrong transfer of either 'Answer (ii) or :Titre" or Both otherwise penalise FULLY for a storage figure used in either case.
3. Units may not be shown at if shown must be correct otherwise penalise 1/2mk for WRONG UNIT used.
4. In the formula method if the wrong formula is given practice FULLY and award 0 mk.
5. In the formula method accept answer only if tied to correct substitution, otherwise penalise fully.

iv) Molar mass of the alkanoic acid
= 25.0
Ans (ii)
- Correct Answer

NOTE:

i) Penalise 1/2mk for WRONG TRANSFER of ans (ii) otherwise penalise FULLY for strange figure used.
ii) Penalize 1/2mk for wrong ANSWER if arithmetic error is outside + 5 units in the 1st d.p
iii) Penalise 1/2mk for either ommission of the (g) in or for wrong units used.

PROCEDURE II

TABLE II..... 6 mks

a) Complete table..... 3 mks
Conditions/Penalise

i) Award $^{1}/_{2}$ mk for each expt done completely

iii) Penalise $^{1}/_{2}$ mk once for wrong arithmetic

iv) Treat initial temp reading >40^0C and <10^0C as used reading are inverted.

v) If T = 0 or CONSTANT THROUGHOUT or T THROUGHOUT award $^{1}/_{2}$ mk for complete table with 6 expts done otherwise credit 0 mk

vi) Penalise $^1/_2$ mk on complete table if the variety in initial TEMP readings is beyond + 2.0^0C of the FIRST initial temp.

vii) Penalise 1/2 mk ONCE for T >10^0C where not all values are greater than 10^0C

b) Use of decimals (tied to 3rd & 4th row)

Accept temp readings given conssistently either as whole number or to Td.p (.0 or .\5) otherwise penalise fully.

c) accuracy.....1mk

(Tick the value in the table)

Compare the candidates FIRST "Initial temp readings with the SV.

If within + 2.00C of the SV award 1mk otherwise penalise them

NB: SV is the 1st initial temp readings for the teacher.

d) Trend (tied to T).....1 mk

Accept a continuous rise in T upto a maximum for 1/2 mk followed by either a constant followed by or a continuous drop in T for another 1/2mk

NB: Where there was wrong arithmetic in the table use the correct values in awarding the trend. (1 mk)

GRAPH..... 3mks

a) Labelling o axes.....1/2mk

To award the 1.2mk Both AXES MUST be correctly labelled

Conditions

1) Penalise fully for wrong units used otherwise accept CORRECT labelling even if no axis are shown.
ii) Penalise fully if only one axis is correctly labelled.
iii) Change in Temp (T) must appear on the vertical axis and vol of solution A on horizontal axis otherwise penalise fully for inverted axis.
iv) Reject labelling of axis if temp above is used instead of change in temp (T) in vertical axis.

b) Scale.....1/2mk

i) Area covered by the actual plots must be at 31/2 big squares (vertical axis) by 1/2 big sq. (horizontal ais)
ii) the scale internal must be constant on each axis.
iii) Scale drawn must be able to accommodate the plots, whether plotted or not (check the range of values on both axes)

NB: i) Penalise fully if nay of the above condition is not met.

ii) Award for the scale even if the axes are interchanged so long as the above conditions are met.

c) Plotting..... 1mk

i) for 5 or 6 points plotted correctly award -1/2 mk
ii) fro 4 or 3 points are correctly plotted award - 0 mk
iii) For less than 3 points correctly plotted award - 0 mk
2. If the scale interval changes move the plots (if nay) in the first scale interval only consider the rest of the plots (if any) or wrong plots
3. Accept the correct plots even if the axes are inverted/interchanged.

d) The line/shape 1mk

Conditions

1) Award 1/2mk for STRAIGHT LINE showing a

ii) Award another 1/2mk for an extraplotte line showing a drop

NB: i) Accept lines of best fit

iii) If the axes are interchanges REJECT the lines and the readings from the graph

b) but accept the reading in subsequent workings in (c) and d

iv) Accept any one of the following for 1/2mk

b) Vol. of soln A = Vcm3

NB: i) Accept correct reading of V with or with showing on extraplotted graph CORRECTLY but read if wrong or Not given award only 1/2mk for correct showing on the graph.

ii) If shown on the graph CORRECTLY but reading is wrong or NOT given award only 1/2mk for correct showing on the graph.

iii) Penalise 1/2mk for wrong units otherwise ignore if units not given.

iv) If value of V > 2.5cm^3 REJECT an award 01

v) REJECT showing and reading of V from a wrong graph but accept in (c) below if used correctly.

c) Volume of B = 30 - Ans (b) above (30 - v)

= correct ans.

NB: 1) V o 30cm3 is unrealistic and unacceptable and hence penalise FULLY and consequently and award working both d (i) and d (ii) below and award 0 mk in each case

ii) Penalise 1/2mk for wrong UNITS and another 1/2mk if working Not shown.

d) i) Ratio of volume A and B

= Ans (b) Ans (c)

or

Ans (c) ; Ans (b)

= 1:1

NB: IF ration is not 1:1 penalise 1/2mk but accept the ratio in d (ii) if used correctly

Moles of Acid used = moles of NaOH

Molarity in acid = $\frac{2 \times \text{Ans (c)}}{1000} \times \frac{1000}{\text{Ans (b)}}$

= corr ans.

OR

Conc of sol A = $\frac{2 \times \text{Ans (c)}}{\text{Ans b}}$

= Correct ANS

OR

MaVa = MBVB

M_A = 2 x Ans 9c)

Ans (b)

= Corr ans

Conditions

i) Accept answer tied to correct arithmetic other penalise 1/2mk for arithmetic error outside + 2 in the 1st d.p.

ii) Penalise 1/2mk for WRONG TRANSFER of ans (c) or BOTH otherwise penalise fully for STRANGE figure in either case.
NB: Penalise fully for any calculation noted beyond the expected Ans
NB: Penalise fully for any contradictory functional group

ii) PH is 1 or 1
Accept red for 1/2mk
but reject inference given
on its strength
Reject pH range
penalise fully and correct P.H
NB: If a wrong colour is given penalise fully for the PH

strongly acidic
Reject; Acidic given alone
G is a strong acid
ignore carboxylic acid

ii) KM_nO_4 decolourised
OR KMnO4 turns from
purple to colourless
REJECT
- KMnO4 turns coloures
- Solutions turns colourless
- Solution decolourised
- Solution discolourised

C = C or - C - C

R - OH
NB: Reject the groups in
words - OH
- penalise 1/2mk for each
contracting functional
group

iii) Bromine water decoloured
or Bromine water turns from
red/yellow/orange to colourless
Reject:
i) Bromine water turns colourless
ii) Solution turns colourless
iii) Solution discoloured
iv) Solution discoloured

C = C or C = C

NB: Penalise fully for any contradictoryfunctional gps

- Accept unsaturated organs

	OBSERVATIONS	**INFERENCE**
2	a) White ppt	Pb+2, Ca+22, Ba+2 If all the 3 given - 2 If only 2 given - 1mk If only 1 given - 1.2mk Note L Fro any contradiction mark out of 1/2mk 1/2mk for any contradiction
	ii) White ppt which dissolves in excess Reject white residue /solid	Pb+2 NB: Credit Pb+2 only if m in (i) above

suspension Accept - white solid	- penalise fully for any Ca ion
iii) White ppt	- f contains SO-24, Cl- So or So42-, cl, So32-, Co32 4 ions given - 1 mk 3 or 2 ion given = 1.2mk ion given - 0 mk Penalties Penalise FULLY if candidate E contains the above ions - Penalise 1/2mk for contradictory
iv) Yellow ppt	Pb2+ - Penalise FULLY for any contradictory ions
i) Burns with a Smoky/sooty flame Reject - yellow frame Accept - yellow sooty flame	C = C / - C - C - Accept long chain hydrocarbon carbon: hydrogen ratio
iii) Effervescence/bubbles fizzing - Oduorless gas NB: Odourless to differentiate between SO2 & CO2 Reject: Hissing - Odourless mentioned alone	CO_3^{2-} - present in f (Tied to part (a) (iii) NB (i) Ignore mention of acid ii) Penalise FULLY for contradictory ion iii) The inference is tied to effervescene bubbles and odourless