



CENTRAL WEST EDUCATION DIVISION

2026 MSCE MOCK EXAMINATIONS

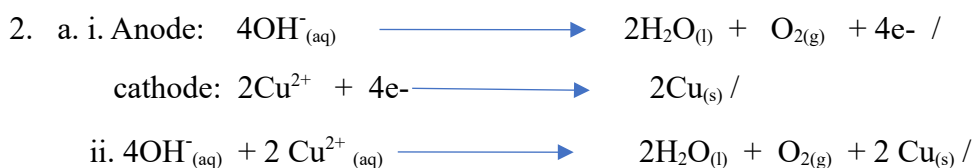
PAPER I

PROVISIONAL MARKING KEY

SECTION A

1. a. - Making plastic pipes/ since they are tough /
- Used as insulators/ because they are poor conductor of heat or electricity/
b. Branched isomer has a reduced surface area of contact which weakens intermolecular forces/ unlike straight isomers which has an increased surface area of contact which strengthen intermolecular forces/.
c. - Preservation of dead bodies /
- Fuel composition/
- Solvent/

(Any one)



- b. i. Treatment of effluents/
ii. treatment of domestic wastes/
iii. Preparation of insoluble salts/
c -dilute sodium hydroxide/

- Aqueous ammonia solution/

(any one)

3. a. – making Machine bearings /
- making Musical instruments/
- making Jewelleries/

(any one)

- b. Occurs between molecules containing hydrogen and a more electronegative atom than hydrogen atom./ The attraction between partially negative atom and partially positive hydrogen atom form a bond./



c. Absorbs harmful ultraviolet radiation from the sun protecting the existence of life on earth,/
d. Low water PH can be raised by adding lime to make it less acidic,/
e. Ionic compounds have oppositely charged ions that alternate while covalent compounds have no charge/

or

-Ionic compounds have a giant ionic lattice while covalent compounds are molecular./

4. a. Iron is coated with Zinc/ so that when exposed to conditions for rusting, it is zinc that reacts and not iron since zinc is more reactive than Iron./

b. -both are very hard/

-both do not conduct electricity/

-both have very high melting point/

-both are insoluble in water and organic solvents/

(any two)

c. Ammonia reacts with nitric acid to form Ammonium Nitrate in a reaction chamber/. Then Ammonium nitrate is crystallised and dried/.

5. a.i. Q: Pentanoic acid /

S: Butan-2-one or 2 butanone/

ii. -Pour 5ml of solution P and R into separate test tubes/.

-Add 5 drops of Fehlings solution into the test tubes containing the compounds/.

-Heat the contents gently for 5 minutes and observe/.

-If P turns red precipitate, it is butanal and if R remains unchanged it is butanol/.

OR

-Pour 2ml of solutions P and R into separate test tubes/.

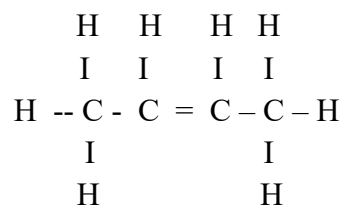
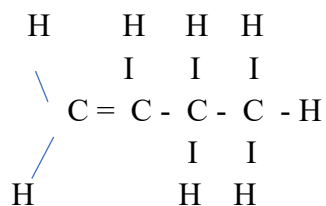
-Add 2-3 drops of Tollen's solution into the test tubes containing the compounds/.

-Observe the results and record/.

-If solution P turns silvery mirror, it is butanal, if solution R remain unchanged, it is butanol/.

b.





(1 mark for positioning double bond, I mark for correct structure in each diagram)

6. a. – moles/dm³ /

- g/cm³ /

(any two)

- as a percentage/.

$$\begin{aligned}
 \text{b. Number of moles} &= \frac{\text{mass}}{\text{molar mass}} \\
 &= \frac{18\text{g}}{120\text{g/mol}} \\
 &= 0.5 \text{ moles} \quad /
 \end{aligned}$$

$$\begin{aligned}
 \text{Molarity} &= \frac{\text{number of moles}}{\text{Volume}} \\
 &= \frac{0.15\text{moles}}{0.15\text{dm}^3} \quad /
 \end{aligned}$$

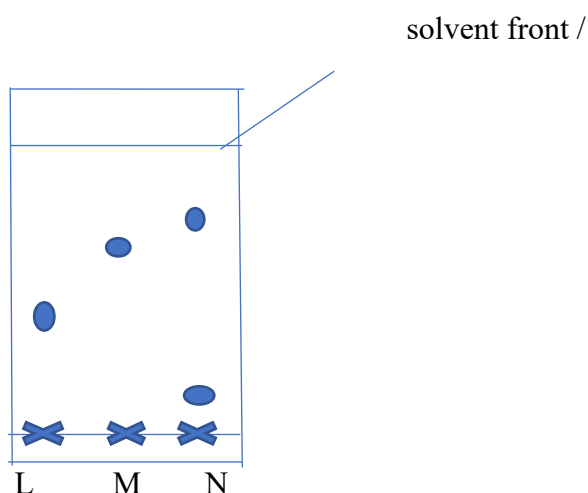
$$= 1 \text{ mol/dm}^3 \quad /$$

or

$$= 1\text{M} \quad (\text{with correct units or without})$$

c. Boiling decomposes Calcium hydrogen Carbonate into insoluble deposit of Calcium Carbonate/. Insoluble deposits of Calcium Carbonates are filtered out. The remaining water becomes soft/.

7. a. i. diagram



ii. N /

$$\begin{aligned} \text{iii. Relative Flow Value} &= \frac{\text{distance moved by substance}}{\text{distance moved by solvent front}} / \\ &= \frac{2.7}{4.2} / \\ &= \underline{0.6} / \end{aligned}$$

b. A filter paper is dipped in acidified potassium dichromate (Vi)/ and is brought to the mouth of the jar containing gas under test /. If the gas is Sulphur dioxide, it will change the filter paper from orange to green/.

8. a. Burning of organic fuels releases greenhouse gases/ which causes global warming/.

b.- carbon dioxide/.

- soot/.

(Any one)

c. -Thermosetting plastics have cross links while thermos softening plastics have no cross links/.

- Thermosetting plastics cannot be remoulded when heated while thermos softening plastics can be remoulded when heated/.

-Thermosetting plastics do not melt and soften (char) when heated/ while thermos softening plastics can melt and soften when heated/.

(any one)

9. a. – Making inorganic fertilizer/

- Rust remover from surfaces/.

- food additive /.

- Electrolyte in phosphoric acid fuel cells/.

(Any two)

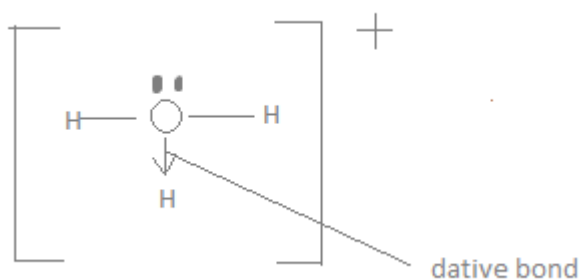
b. Oxide that has both acidic and basic properties/.

c. Active electrodes participate in the reaction / thereby overriding the ions in the solution/.

10. a. i. Oxidation half equation: $\text{H}_{2(\text{g})} \longrightarrow 2\text{H}^+_{(\text{aq})} + 2\text{e}^-$ /

ii. Reduction half equation: $\text{Cl}_{2(\text{g})} + 2\text{e}^- \longrightarrow 2\text{Cl}^-_{(\text{aq})}$ /

b.



1 mark for correct structure

1 mark for labelling

c. Oxidation state of Carbon in NaHCO_3

$$= (+1) + (+1) + \text{C} + 3(-2) = 0 \quad /$$

$$= +2 + \text{C} - 6 = 0 \quad /$$

$$= -4 + \text{C} = 0$$

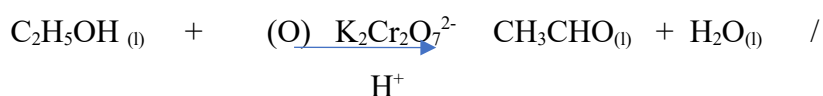
$$= \underline{\text{C} = +4} \quad /$$

SECTION B

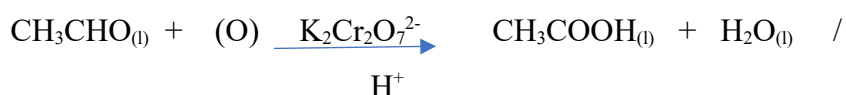
11. a. Hard water is passed through a resin/ made up of insoluble complex of sodium ions (Na^+) / . The permutit releases Sodium ions which exchanges with Calcium ions and magnesium ions in hard water/. Calcium and Magnesium become part of permutit while sodium ion becomes part of water/ and the water is soft free from ions that cause water hardness/.

- b. – Metals are collected from different sources where they are regarded as wastes/
 - metals are sorted out using huge magnets/
 - Metals are processed by compacting and breaking them down into manageable sizes/.
 - Metals are broken down further into smaller pieces/.
 - Metals are heated in order to melt them then electrolysed to purify it/.

12. a. – Ethanol reacts with oxygen in the presence of acidified potassium dichromate to produce ethanol and water/.



- Ethanal is further oxidised in the presence of acidified potassium dichromate to produce ethanoic acid and water/.



(1 mark for oxidizing agent)

- b. – Put Calcium Carbonate in a crucible placed at the tripod stand/
 - Heat the crucible containing Calcium carbonate with a bursen burner/.
 - Continue heating until there is no more change/.
 - Let the mixture cool for some time /.
 - compare the original material with the product. When Calcium Carbonate was heated it produced Calcium Oxide and Carbon dioxide. Upon cooling it will not produce Calcium Carbonate/.
13. a. Measure 50cm³ of 2M Hydrochloric acid and transfer into a conical flask using a measuring cylinder/.
 b. Weigh 2 grams of fine marble powder on a watch glass using electronic balance/.
 c. Put the marble powder into the flask containing Hydrochloric acid and immediately place the flask and its contents on electronic balance. Let the initial balance reading be **a** /.
 d. Leave the set up for some time to allow reaction to occur. Record balance reading after every minute until there is no change in mass. Record as **b** /.



- e. Calculate the loss in mass (**a-b**)g and record/.
- f. Repeat the experiment with 2g of small marble chips. /
- g. Compare the results/.
- h. If the loss in mass for fine marble powder and small marble powder differs in time, it shows surface area affect rate of reaction./

(2 marks for materials any: fine marble powder, small marble chips,
electronic balance, watch glass.)

END OF PROVISIONAL MARKING KEY

