**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ADM NO: \_\_\_\_\_\_\_\_\_\_\_CLASS:\_\_\_\_\_\_\_\_\_\_**

**DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ SIGN: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**CHEMISTRY**

**FORM: 3**

**TERM 1 2025**

**OPENER EXAMINATION**

**INSTRUCTIONS: *Answer all the Questions* TIME: 1 HR 30 MIN**

1. In an experiment, lead nitrate Pb(NO3)2(aq) reacted with magnesium sulphate (MgSO)4(aq)
2. Derive an ionic equation for the above reaction. (3mks)

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1. Given lead (II) oxide, nitric (V) acid, sodium carbonate solution, water, explain into details how you can prepare lead II carbonate. (3mks)

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1. .

BLUE SOLID

BLACK SOLID

BROWN GAS

SOLUTION K OF PH4

H2O

1. Identify:
2. Black solid –
3. Blue solid –
4. Brown –
5. Write a chemical equation between Brown gas and water to form solution K. (2mks)

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2. The reactivity of alkali metals increase down the group while that of halogens increase up the group. Explain. (2mks)

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3. The first and second ionization energies of sodium are 496KJMol- and 4563KJMol- respectively. Explain why the second ionization energy is far much higher than the first ionization energy. (2mks)

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4. Explain the following observations:

1. Solid sodium chloride does not conduct electricity whereas molten sodium chloride and sodium chloride solution are good conductors of electricity. Explain. (2mks)

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 b. Sodium has a melting point of 98OC while aluminium has a melting point of 660OC (atomic numbers : Na=11, Al=13) (2mks)

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5. Spots of pure pigments A and B and a mixture Z were placed on a filter paper and allowed to dry. The paper was then dipped in a solvent. The results obtained were as the paper chromatogram.

C

X

Y

W

Z

B

D

C

1. Which is the; (2mks)
2. Baseline?
3. Solvent front?
4. Which of the pure pigments was a component of Z? Explain. (2mks)

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6. The diagram below shows the inter-conversions between the various states of matter. Study it and answer the questions that follow:

E

SOLID

LIQUID

GAS

A

B

C

D

F

1. Name the processes labeled A to E. (3mks)

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1. Name any two substances that can be recovered from a solid mixture using the processes labeled E and F. (2mks)

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7 (a) What is rust? (1mk)

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(b) Explain one advantage of rusting. (1mk)

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(c) Name two methods of preventing rust. ………………………………………………………………………………………………………………………………………………………………………………………

8 The set-up below was used to investigate the products formed when candle wax burns in air. Study it and answer the questions that follow.



1. What observations are made in:
2. Test-tube A? (1mk)

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1. Test-tube B? Explain. (2mks)

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1. Explain why test-tube A is dipped in cold water. (1mk)

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9. The atomic numbers of elements C and D are 19 and 9 respectively. State and explain the electrical conductivity of the compound CD in:

1. Solid state. (1 ½ mks)

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1. Aqueous state. (1 ½ mks)

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10. What type of bond is formed when lithium and fluorine reacts? Explain. (Atomic numbers Li=3 and F=9) (2mks)

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11. Iron (III) oxide was found to be contaminated with copper (II) sulphate. Describe how a pure sample of iron (III) oxide can be obtained. (3mks)

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12. Using dots (.) and crosses (x) to represent electrons draw diagram to represent the bonding in; (4mks)

1. NH3
2. NH4+

13. (a) What are isotopes? (1mk)

(b) Lithium has two isotopes $ and $. Determine the number of neutrons in $.$ (2mks)

(c) If the relative atomic mass of lithium is 6.94. Which of the two isotopes is the most abundant? Give a reason. (2mks)