

545

Chemistry

1½ hours

S3 CHEMISTRY

1 hour 30 minutes

INSTRUCTIONS:

This paper consists of two sections A and B.

Section A consists of 35 objective questions.

Answer all questions in section A and section B.

For section A write the correct answer A, B, C or D on the answer sheet provided below.

For section B write the correct answers in the spaces provided for each question.

Do not use pencil.

(SECTION A Answer sheet)

1		6		11		16		21		26		31	
2		7		12		17		22		27		32	
3		8		13		18		23		28		33	
4		9		14		19		24		29		34	
5		10		15		20		25		30		35	

SECTION A (35mks)

1. A solution of sugar in water was fermented with yeast for some time. The mixture was carefully distilled. Which statement about the first few drops of the distillate is not correct? The first drop of the distillate;
- A. Had a higher boiling point than water.                      B. Miscible with water.  
C. Was colourless.                                                      D. Non volatile.
2. The metal ring of a Bunsen burner is used for;
- A. Regulating the amount of air entering the Bunsen burner.  
B. Increase the volume of the gas entering the chimney.  
C. Brings the gas into the Bunsen burner.  
D. Turn the gas into a stream.
3. A gas that is soluble in water and less dense than air is collected by
- A. Upward delivery.                                              B. Overwater.  
C. Upward displacement of air.                                              D. Downward delivery.
4. Which of the following burns in air to form an acidic oxide?
- A. Potassium                                              B. Sulphur  
C. Sodium      D. Magnesium
5. In fractional distillation of petroleum, the product that is obtained first is the one which has the
- A. Highest density      B. highest boiling point  
C. lowest density                                              D. lowest boiling point
6. Element X burns in excess oxygen to form a yellow solid, which dissolved in water to produce a colourless gas that is neutral to litmus and relights a glowing splint. Element X is
- A. Magnesium                                              B. Sodium  
C. Calcium                      D. Aluminum
7. Zinc carbonate was heated and the residue allowed to cool. Which one of the following is the colour of the residue?
- A. Black.                                              B. Yellow.  
c. White.                                              D. Reddish-brown.

8. Which one of the following sets of substances is formed when potassium hydrogen carbonate is heated?

- A. Potassium carbonate and water.
- B. Potassium oxide and carbon dioxide.
- C. Potassium oxide, carbon dioxide and water.
- D. Potassium carbonate, carbon dioxide and water.

9. Which of the following forms of carbon consists of hexagonal crystals?

- A. Graphite.
- B. Diamond.
- C. Soot.
- D. Lamp black.

10. Which one of the following can be used to distinguish a carbonate from a hydrogen carbonate?

- A. Sodium sulphate solution.
- B. Hydrochloric acid.
- C. Magnesium sulphate solution.
- D. Nitric acid.

11. Which one of the following is a thermosetting plastic?

- A. Polyethene.
- B. Perspex.
- C. Nylon.
- D. Rubber.

12. Which one of the following electronic configuration is of a noble gas?

- A. 2:8:1
- B. 2:8:8
- C. 2:8:2
- D. 2:8:7

13. Which one of the following methods is used to separate the alkanes in crude petroleum?

- A. Filtration.
- B. Decantation.
- C. Fractional distillation.
- D. Fractional crystallisation.

14. Which one of the following metals will react most readily with cold water?

- A. Sodium.
- B. Calcium.
- C. Magnesium.
- D. Potassium.

15. Which one of the following substances when heated undergoes a chemical change?

A. Ammonium chloride.

B. Copper(II) hydroxide.

C. Candle wax.

D. Sulphur.

16. Which one of the following substances is used to test for the presence of oxygen?

A. A glowing splint.

B. A burning splint.

C. Litmus paper.

D. Anhydrous copper(II) sulphate.

17. Which one of the following is the colour of the precipitate formed when lead(II) nitrate solution is added to sodium chloride solution?

A. Blue.

B. Brown.

C. Yellow.

D. white.

18. Which one of the following particles conducts electric current in molten lead(II) bromide?

A. Electrons.

B. Molecules.

C. Atoms.

D. Ions.

19. The electronic configurations of elements L, M, V and R are 2:8:3, 2:8:6, 2:8:8 and 2:8:8:2 respectively. Which one of the following pairs of elements consists of metals only?

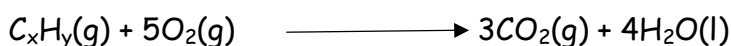
A. M and V

B. L and V

C. M and R

D. L and R

20. A hydrocarbon  $C_xH_y$  burns in oxygen according to the following equation;



Which one of the following are the values of x and y respectively?

A. 1 and 4.

B. 2 and 4.

C. 3 and 8.

D. 4 and 10.

21. Zinc carbonate was heated and the residue allowed to cool. Which one of the following is the colour of the residue?

A. Black.

B. Yellow.

C. White.

D. Reddish-brown.

22. The atomic number of element X is 11. Which one of the following is **not** a property of the oxide of X?

A. It has a high melting point.

B. It conducts electricity in solid state.

C. It is soluble in water.

D. It is a basic oxide.

23. Which one of the following statements is **correct** about graphite and diamond? They both

A. have giant structures.

B. have similar physical properties.

C. have different chemical properties.

D. are hard substances.

24. Which one of the following is **not** formed when zinc nitrate is heated strongly?

A.  $O_2$

B. ZnO

C.  $NO_2$

D. NO

25. Element Y has atomic number 13. The chemical bond in the sulphide of Y is

A. ionic bond.

B. covalent bond

C. dative bond.

D. metallic bond.

Each of the questions 26 to 31 consists of an assertion (statement) on the left hand side and a reason on the right hand side. Select

A: if both the assertion and the reason are **true** statements and the reason is a **correct** explanation of the assertion

B: if both the assertion and the reason are **true** statements but the reason is **not a correct** explanation of the assertion

C: if the assertion is **true** but the reason is **not a correct** statement.

D: if the assertion is **not** correct but the reason is a **correct** statement.

## INSTRUCTIONS SUMMARISED

Assertion	Reason
A: True	True (reason is correct explanation )
B: True	True (Reason <b>not</b> a correct explanation)
C: True	Incorrect
D: Incorrect	Correct

26. Concentrated sulphuric acid is used to dry carbon dioxide	<b>because</b>	it is a dehydrating agent.
27. Isotopes of an element show similar chemical properties	<b>because</b>	Isotopes of an element have the same number of electrons
28. In the preparation of dry carbon dioxide, the gas is collected by upward displacement of air.	<b>because</b>	Carbon dioxide does not mix with air.
29. Sodium chloride dissolves in water	<b>because</b>	Sodium chloride is formed by transfer of electrons from Sodium to chlorine atoms.
30. Elements in group II of the Periodic table are more reactive than those in group I.	<b>because</b>	group II elements need to lose two electrons in order to achieve stable noble gas structure.
31. Carbon dioxide extinguishes burning magnesium.	<b>because</b>	Carbon dioxide does not support combustion.

In each of the questions 32 to 35, one or more of the answers given may be correct. Read each question carefully and then indicate the correct answer according to the following

A: If 1,2 and 3 only are correct

B: If 1 and 3 only are correct

C: if 2 and 4 only are correct

D: If 4 only is correct

32. Which of the following substances is/are formed when anhydrous copper(II) nitrate is heated strongly?

1. Copper(II) oxide.

2. Nitrogen dioxide.

3. Oxygen.

4. Copper metal.

33. Which of the following substances is/are formed when magnesium is reacted with steam?

1. Oxygen.

2. Hydrogen.

3. Magnesium hydroxide.

4. Magnesium oxide.

34. An element P is divalent and reacts with acid. Element P

1. belongs to group II in the periodic table.

2. is above hydrogen in the reactivity series.

3. ionizes by loss of two electrons.

4. ionizes by gain of two electrons.

35. Which of the following statements is/are true about the halogens?

1. Are oxidizing agents.

2. Belong to the same period of the periodic table.

3. Reactivity of the halogens decreases down the group.

4. Reactivity of the halogens increases down the group.

SECTION B (15mks)

(Write the answers in the spaces provided)

36. Write equation for the preparation of hydrogen gas using dilute hydrochloric acid and

a) Zinc metal. (1 mk)

.....

b) Magnesium metal. (1 mk)

.....

37). Write equation for the preparation of oxygen gas

a) Using hydrogen peroxide. (1 mk)

.....

b) Using sodium peroxide. (1 mk)

.....

c) Using potassium chlorate. (1 mk)

.....

38. State what is observed and write equation for the reaction when

a) Hydrogen gas is burnt in oxygen

i) Observation. (1mk)

.....

ii) Equation. (1 mk)

.....

b) Dry hydrogen gas is passed over heated copper(ii) oxide

i) Observation. (1mk)

.....

ii) Equation.(1 mk)

.....



39. State what is observed and write equation for the reaction when sodium metal burns in excess oxygen

a) Observation. (1mk)

.....

b) Equation.(1 mk)

.....

40. State what is observed and write equation for the reaction when

a) Magnesium burns in oxygen

i) Observation. (1mk)

.....

ii) Equation. (1 mk)

.....

b). Carbon burns in limited oxygen

i) Observation. (1mk)

.....

ii) Equation. (1 mk)

.....

END.