

S.2 CHEMISTRY

Name:.....Stream.....

INSTRUCTIONS:

This paper consists of Sections A and B
Attempt **ALL** questions in both Sections
Use the answer space provided for the questions.

SECTION A ANSWER SPACE

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

SECTION A

- Which one of the following is a basic oxide?
 - SO₂
 - ZnO
 - P₂O₅
 - CaO
- Beginning with the least reactive, the order of reactivity of the following metals with dilute hydrochloric acid is
 - iron, aluminium lead, zinc
 - zinc, lead, aluminium, iron
 - lead, iron, zinc, aluminium
 - aluminium, zinc, iron, lead
- The atomic number of an element is
 - the number of electrons and protons
 - the number of protons and neutrons
 - the number of neutrons
 - the number of protons
- The atomic numbers of elements X and Y are 7 and 9 respectively. The formula of the compound formed between X and Y is

- A. XY_3
 - B. XY_2
 - C. X_3Y
 - D. X_2Y
5. Isotopes are different atoms of the same element with the
- A. same number of protons, neutrons and electrons.
 - B. same number of electrons and neutrons but different number of protons.
 - C. same number of protons and neutrons but different number of protons.
 - D. same number of protons and electrons but different number of neutrons.
6. Which one of the following substances conducts electricity?
- A. Zinc
 - B. Neon
 - C. Chlorine
 - D. Sulphur
7. How many electrons are there in oxygen (O^{2-}) ion?
(The atomic number of oxygen is 8)
- A. 6
 - B. 8
 - C. 10
 - D. 16
8. Which one of the following gases will reduce copper (II) oxide to copper?
- A. Hydrogen
 - B. Water vapour
 - C. Chlorine
 - D. Oxygen
9. An atom of an element X has 19 electrons. In the Periodic Table X belongs to
- A. group I
 - B. group II
 - C. group III
 - D. group IV
10. An atom 41 M forms a chloride of the formula MCl_2 . Which one of the following

atoms forms a chloride with a similar formula?

- A. 25R
12
- B. 25T
13
- C. 21Y
10
- D. 22Z
11
11. In the order of the reactivity of the elements K, Na, Mg, Al, C, Zn and Cu, potassium is the most reactive and lead is the least reactive. Which one of the following reactions is possible?
- A. $2\text{Na}_2\text{O}_{(s)} + \text{C}_{(s)} \xrightarrow{\text{heat}} 4\text{Na}_{(s)} + \text{CO}_{2(s)}$
- B. $2\text{MgO}_{(s)} + \text{C}_{(s)} \xrightarrow{\text{heat}} 2\text{Mg}_{(s)} + \text{CO}_2(g)$
- C. $\text{Mg}_{(s)} + \text{CuO}_{(s)} \xrightarrow{\text{heat}} \text{MgO}_{(s)} + \text{Cu}_{(s)}$
- D. $2\text{Al}_{(s)} + 3\text{K}_2\text{O}_{(s)} \xrightarrow{\text{heat}} \text{Al}_2\text{O}_{3(s)} + 6\text{K}_{(s)}$
12. A separating funnel can be used to separate a mixture of water and petrol because the two liquids.
- A. are miscible
- B. are immiscible.
- C. have different densities.
- D. have different boiling points.
13. When sodium nitrate is heated it gives
- A. nitrogen dioxide
- B. sodium oxide and nitric oxide.
- C. oxygen
- D. oxygen and nitrogen dioxide
14. Which one of the following properties is NOT shown by group VII elements? They
- A. are all non-metals
- B. are all gases at room temperature
- C. all form ionic compounds with group I elements.
- D. all form diatomic molecules.
15. The process by which water vapour is changed into dew is called
- A. distillation

- B. efflorescence
 - C. condensation
 - D. evaporation
16. Atoms of elements in the same group in the periodic table have the same number of
- A. outer shell electrons
 - B. electrons outside the nucleus
 - C. protons in the nucleus
 - D. neutron in the nucleus
17. A metal normally reacts with dilute mineral acids to give
- A. the oxide of the metal and hydrogen
 - B. a salt of the metal and water
 - C. the hydroxide of the metal and hydrogen
 - D. a salt of the metal and hydrogen
18. An atom of an element has the structure $20X$. The element
- 10
- A. forms covalent bonds readily with non-metals.
 - B. forms ionic bonds with non-metals
 - C. belongs to group II of the periodic table.
 - D. has full shells of electrons.
19. The ion formed by the element X of atomic number 13 is
- A. X^{3+}
 - B. X^{2+}
 - C. X^{2-}
 - D. X^{3-}
20. Which of the following mixtures is best separated by chromatography?
- A. Ink
 - B. Crude petroleum
 - C. Water and oil
 - D. Water and ethanol
21. Which one of the following is an electronic configuration of an atom of an inert gas?
- A. 2:8:8

- B. 2:8:7
C. 2:8:6
D. 2:8:8:1
22. The number of neutrons in the nucleus of an atom, ${}_{17}^{37}\text{X}$ is
- A. 17
B. 20
C. 37
D. 54
23. An oxide of metal Z reacts with magnesium when heated but it does not react with copper. The order of reactivity of Z, magnesium and copper starting with the most reactive is
- A. Cu, Z, Mg
B. Z, Mg, Cu
C. Mg, Cu, Z.
D. Mg, Z, Cu
24. Which one of the following substances sublimes when heated?
- A. ZnO
B. CaCl_2
C. I_2
D. P
25. The atomic numbers of elements Q, R, S, and T are 8,9,13 and 17 respectively. Which one of the following pairs of elements belongs to the same group in the periodic table?
- A. Q and R
B. Q and S
C. R and T
D. S and T
26. The red brown coating formed when iron nail is left in moist air for a long time is
- A. hydrated iron (II) oxide
B. hydrated iron (III) oxide
C. anhydrous iron (II) oxide
D. anhydrous iron (III) oxide
27. Which one of the following methods is normally used to prepare hydrogen in the laboratory?

- A. Electrolysis of water.
 - B. Action of water on magnesium
 - C. Action of dilute hydrochloric acid on zinc.
 - D. Action of steam on zinc.
28. A carbonate of an element Y has the formula $Y_2(CO_3)_3$.
To which group in the Periodic Table does Y belong?
- A. 1
 - B. 2
 - C. 3
 - D. 4
29. The alloy solder consists of
- A. zinc and lead
 - B. copper and lead
 - C. copper and aluminium
 - D. tin and lead.
30. Which one of the following metals will not displace lead from its salt in solution?
- A. Aluminium
 - B. Calcium
 - C. Silver
 - D. Zinc

SECTION B

31. Define the following terms. **(5 marks)**

(a) An atom.....
.....

(b) Oxidation.....
.....

(c) Boiling point.....
.....

(d) Isotopes.....

.....
(e)An alloy.....

32. The atomic number of element Q is 13

(a) Write the electronic configuration of an atom of Q (1mark)

.....
(b) To which group in the Periodic Table does Q belong? (1mark)

.....
(c) State whether Q would conduct electricity or not. (1 mark)

.....
(d) (i) Write the formula of the oxide of Q. (1 mark)

.....
(ii) State the type of bonding in the oxide of Q. (1 mark)

33. Part of the Periodic Table is shown below. The letters are not the usual symbols for elements.

I	II		III	IV	V	VI	VII	VIII
							T	
P	Q				S		U	
							W	V

(a) Which is the least reactive element? (1 mark)

.....
(b) Which one of the elements, T, U and W reacts most vigorously with Q?
(1 mark)

.....
(c) Write the formula of the compound formed between Q and S. **(1 mark)**

.....
(d) The compound formed between P and W was dissolved in water.
State whether resultant solution was acidic, basic or neutral. **(1 mark)**

.....
(e) Which two elements represented in the table can react as reducing agents?
(1 mark)

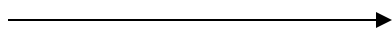
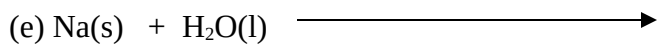
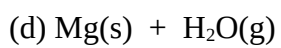
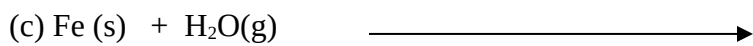
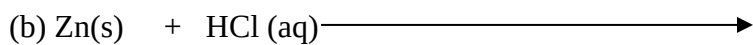
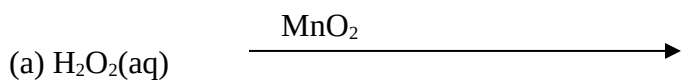
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34. Using the outermost energy level only, show how the following elements react to form compounds: **(5 marks)**

(a) Nitrogen with hydrogen to form ammonia

(b) Hydrogen with oxygen to form water

(c) Magnesium with chlorine to form magnesium chloride

35. Complete the following equations: (10 marks)



37.(a) Define the term oxide (5 marks)

.....

.....

(b) State whether the following oxides are acidic, basic, neutral or amphoteric.

(a) ZnO.....

(b) SO₂.....

(c) K₂O.....

(d) N₂O.....

(d) Write an equation for the reaction between potassium oxide and water. (1½marks

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.
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END