Name:……**Signature:**……..**Stream:**……

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CHEMISTRY
Paper 1
Mar./April.2020 **S.3**
1 ½ hours.

THE CHEMISTRY DEPARTMENT

MID TERM ONE EXAMINATIONS- 2020

CHEMISTRY

Paper 1

1 hour 30 minutes

INSTRUCTIONS:

This paper consists of **50** *multiple choice questions.*

Answer ***all*** *questions.*

You are required to write the correct answer, **A, B, C** *or* **D** *in* **blue** *or* **black** *ink in the box provided on the right-hand side of each question.*

Do **not** *use pencil. Any questions answered in* **pencil** *will* **not** *be marked.*

For Teachers' Use Only

1. Duralumin is an alloy. It consists of the following elements in their increasing order of reactivity.
    A. Copper, magnesium and aluminium
    B. Magnesium, aluminium and copper
    C. Aluminium, magnesium and copper
    D. Copper, aluminium and magnesium
2. Which one of the following gases relights a glowing splint?
    A. Carbon dioxide
    B. Hydrogen
    C. Nitrogen
    D. Oxygen
3. Which of the following substances is used for the identification of water?
    A. Anhydrous copper(II) sulphate
    B. Hydrated copper(II) sulphate
    C. Anhydrous copper(II) chloride
    D. Hydrated copper(II) chloride
4. The substance formed when iron rusts is
    A. Hydrated iron(II) oxide
    B. Anhydrous iron(II) oxide
    C. Hydrated iron(III) oxide
    D. Anhydrous iron(III) oxide
5. The trend which is observed on moving from left to right across a Period in a Periodic Table is that the
    A. Non metallic character increases
    B. Metallic character increases
    C. Number of energy levels increases
    D. Number of energy levels decreases

6. Which of the following substances will dissolve in water to give a solution that turns red litmus paper blue?
   A. Sodium chloride
   B. Sodium hydroxide
   C. Sodium sulphate
   D. Sodium nitrate

7. Element M belongs to group III of the Periodic table. The most likely formula of its oxide is;
   A. M_2O
   B. MO_3
   C. M_3O_2
   D. M_2O_3

8. Which one of the following pairs **cannot** be used to produce hydrogen?
   A. Sodium and water
   B. Copper and steam
   C. Magnesium and hydrochloric acid
   D. Zinc and hydrochloric acid

9. Which one of the following statement is most likely to be correct for a substance with a giant structure?
   A. It has a low melting point
   B. It has a low volatility
   C. It is soft
   D. It is soluble in water

10. The arrangements in the two columns below show elements in group I and VII in the Periodic Table in their correct order.

Group I		**Group VII**
W	**Top of group**	**E**
X		**F**
Y		**G**
Z	**Bottom of group**	**H**

Which pair of elements will produce the most vigorous reaction when combined together?

A. $W + E$
B. $Z + E$
C. $Z + H$
D. $W + H$

11. The atomic number of magnesium is 12 and its mass number is 24. Which one of the following represents the magnesium ion?

	Protons	Neutrons	Electrons
A	12	12	12
B	12	10	12
C	10	12	10
D	12	12	10

12. 1.22 g of phosphorus combined with 0.95g of oxygen. The simplest formula of the oxide of phosphorus is ? $(P = 31, O = 16)$

A. P_3O_2
B. P_2O_3
C. P_4O
D. P_5O_{10}

13. Which one of the following species is an oxidizing agent in the following reaction?

$$2Fe^{3+}(aq) + Mg \longrightarrow 2Fe^{2+}(aq) + Mg^{2+}(aq)$$

A. Fe^{3+}
B. Fe^{2+}
C. Mg
D. Mg^{2+}

14. 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. I
B. II
C. III
D. IV

15. Which one of the following will **not** react with both acids and alkalis?
    A. Calcium oxide
    B. Aluminium oxide
    C. Zinc oxide
    D. Lead(II) oxide

16. A compound consists of 82.76% carbon and the rest being hydrogen. The simplest formula of the compound is
    A. C_2H_2
    B. CH_2
    C. C_2H_5
    D. C_4H_6

17. The change from Cu^{2+} to Cu involves the
    A. loss of protons
    B. loss of electrons
    C. gain of electrons
    D. gain of protons

18. Halogens are placed in the same group of the Periodic Table because they
    A. are all gases at room temperature
    B. all have seven electrons in their outermost energy level
    C. all form compounds with hydrogen
    D. all contain the same number of energy levels

19. The formula of the sulphate of Q is $Q_2(SO_4)_3$. The likely formula of the chloride of the same element is
    A. Q_2Cl
    B. Q_3Cl
    C. QCl_3
    D. QCl

20. Which of the following reactions does **not** occur?
    A. $Zn(s) + Cu^{2+}(aq) \longrightarrow Cu(s) + Zn^{2+}(aq)$
    B. $2K(s) + Zn^{2+}(aq) \longrightarrow Zn(s) + 2K^{+}(aq)$
    C. $Mg(s) + Pb^{2+}(aq) \longrightarrow Pb(s) + Mg^{2+}(aq)$
    D. $Pb(s) + Mg^{2+}(aq) \longrightarrow Mg(s) + Pb^{2+}(aq)$

21. Which one of the following compounds undergoes a physical change when strongly heated ?
    A. $ZnCO_3$
    B. Na_2CO_3
    C. $(NH_4)_2CO_3$
    D. $MgCO_3$

22. The atomic numbers of elements W, X, Y and Z are 9,11,12 and 14 respectively. Which one of the following pairs of elements combine to form a covalent compound?
    A. W and X
    B. X and Y
    C. Y and Z
    D. Z and W

23. Element M reacts with dilute acids and forms a brown solid when added to copper(II) sulphate solution. Which one of the following is the order of reactivity of M, hydrogen and copper, starting from the most reactive?
    A. Hydrogen > M > copper
    B. M > copper > hydrogen
    C. Copper > hydrogen > M
    D. M > hydrogen > copper

24. 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

25. A hydrocarbon T consists of 85.7% carbon. If the molecular mass of T is 28. The atomicity of T is? $(C = 12, H = 1)$
    A. 8
    B. 6
    C. 4
    D. 2

26. Element M has electronic structure 2:8:8:2. The name given to the chemical family to which M belongs is
    A. Alkali metal
    B. Metalloid
    C. Transition metal
    D. Alkaline-earth metal

27. A period 3 non-metal, X, forms an oxide of formula, X_2O. The electronic configuration of X is;
    A. 2:8:1
    B. 2:8:2
    C. 2:8:3
    D. 2:8:7

28. X, Y and Z are elements in the same short period of the Periodic table. The oxide of X is amphoteric. The oxide of Y is basic and the oxide of Z is acidic. Which of the following is the correct arrangement of the elements in order of increasing atomic number?
    A. X,Y,Z
    B. Y,X,Z
    C. Z,Y,X
    D. Y,Z,X

29. Which one of the following is **not** a property of ionic substances?
    A. They have high melting and boiling points
    B. They are made of molecules
    C. They conduct electricity in the molten state and when dissolved in water
    D. They are usually insoluble in organic solvents like ether and benzene

30. The percentage of oxygen in aluminium oxide is ;
    A. 18.71%
    B. 56.14%
    C. 53.40%
    D. 28.07%

31. The formula of an oxide of element M is M_2O_3. What is the likely electronic configuration of M?
    A. 2:8:1
    B. 2:8:2
    C. 2:8:4
    D. 2:8:3

32. Which one of the following dissolves in water with effervescence?
    A. KO_2
    B. $NaOH$
    C. Na_2O_2
    D. H_2O_2

33. The structure of an atom of element X is $^{24}_{12}X$. Which one of the elements below forms a chloride of similar formula as X?
    A. $^{40}_{20}M$
    B. $^{24}_{11}N$
    C. $^{19}_{9}O$
    D. $^{27}_{13}P$

34. When 2.78g of a hydrated sulphate, $MSO_4.nH_2O$ was heated until no further change, 1.52g of the anhydrous salt was formed. Calculate the number of moles of water of crystallization, n, in the sulphate. $(M = 56, S = 32, O = 16, H = 1)$
    A. 2
    B. 3
    C. 5
    D. 7

35. The boiling and melting points of substances M, N, O and P are given in the table below.

Substance	Melting point(℃)	Boiling point(℃)
M	17	45
N	185	500
O	-40	-70
P	0	100

Which one of the substances is a crystalline solid at room temperature?

A. M
B. N
C. O
D. P

36. Which of the following liquids is a mixture?

A. Ink
B. Ethanol
C. Water
D. Tetrachloromethane

37. The best method to ascertain purity of water is to

A. Use litmus paper
B. Observe it's appearance
C. Determine its boiling point
D. Determine its electrical conductivity

38. The reaction of dilute nitric acid and most metals does not produce hydrogen gas because nitric acid is

A. a weak acid
B. a volatile acid
C. a monobasic acid
D. a strong oxidizing agent

39. Which one of the following oxides will form a metal when heated with aluminium?

A. K_2O
B. MgO
C. Na_2O
D. PbO

40. Solid R conducts electricity and has a high melting point. R is likely to have;

A. a giant metallic structure
B. a giant molecular structure
C. a giant atomic structure
D. a covalent strucuture

*Each of the questions **41** to **45** 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 reason are **true** statements and the reason is a **correct** explanation of the assertion

B. If both the assertion and 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 SUMMARIZED:

	Assertion	**Reason**
A	True	True and is a correct explanation
B	True	True and is **not** a correct explanation
C	True	Incorrect
D	Incorrect	Correct

41.	Zinc reacts with dilute hydrochloric acid faster at 60℃ than at 40℃	**because**	Zinc is higher than hydrogen in the electrochemical series.	☐
42.	An oxide ion has a noble gas configuration	**because**	Oxygen gains electrons to form an oxide ion.	☐
43.	Atomic size decreases along a period of the Periodic Table	**because**	atomic number increases along a period of the Periodic Table.	☐

44. Nitrogen diffuses faster than carbon monoxide. ($C = 12, N = 14, O = 16$)	**because**	nitrogen molecules are monoatomic.	☐
45. Water is a compound	**because**	It consists of hydrogen and oxygen molecules chemically combined together.	☐

In each of the questions ***46*** *to* ***50****, one or more 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

46. Which of the following are industrial uses of hydrogen?
    1. Cutting and welding
    2. Manufacture of ammonia
    3. Synthesis of hydrochloric acid
    4. Hardening of oils to make margarine

☐

47. The full symbol of an element is $^{27}_{13}Z$. The ion of Z contains
    1. 10 neutrons
    2. 10 electrons
    3. 14 protons
    4. 13 protons

☐

48. Which of the following oxide(s) is/are soluble in excess potassium hydroxide?
    1. PbO
    2. CuO
    3. ZnO
    4. FeO

☐

49. Which one of the following is/are true about the product formed when copper is heated in air?

1. It is a black solid
2. It reacts with sodium hydroxide
3. It reacts with nitric acid
4. It is a brown solid

50. When iron fillings are added to copper(II) sulphate solution, which of these is/are observed?

1. Bubbles of a gas are formed
2. A brown solid is formed
3. The solution becomes colourless
4. Heat is produced

END