Conducted by Field Work Centre, Thondaimanaru

In Collaboration with Provincial Department of Education

Northern Province

FWC

Term Examination, July - 2019

Grade – 12 (2020)	Chemistry I	Time : 1 Hours

Part - I

$N_A = 6.022 \times 10^{23} mol^{-1}$ $h = 6.626 \times 10^{-34}$ Js $C = 3 \times 10^8$ ms^{-1} $R = 8.314 \text{J}\, mol^{-1}\, K^{-1}$

❖ **Answer all questions.**

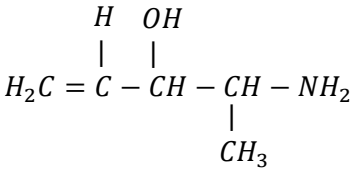
1) The credit of discovering the charge of the electron and discovering neutron respectively goes to the scientists,

1. Thomson and Chadwick
2. Rutherford and Chadwick
3. Chadwick and Thomson
4. Robert milikan and Thomson.
5. Robert milikan and chadwick

2) Which out of the given set of quantum numbers represent the electron removed in the Third ionization energy of Aluminum?

1.	n = 3	l = 1	m_l = +1	m_s = + ½
2.	n = 3	l = 1	m_l = -1	m_s = + ½
3.	n = 3	l = 1	m_l = 0	m_s = + ½
4.	n = 3	l = 0	m_l = 0	m_s = + ½
5.	n = 3	l = 0	m_l = +1	m_s = + ½

3) The IUPAC name of this compound is,



1. 4 – amine – 1 – pentanol.
2. 4 – amino – 4 – methyl – 1 – buten – 3 – ol
3. 4 – amino – 1 – penten – 3 – ol
4. 2 – amino – 4 – penten – 3 – ol
5. 2 – amino – 4 – penten – 3 – ol

4) The concentration of Mn^{2+} in moldm^{-3} , If there is no change in volume when 50 cm^3 of 0.08 moldm^{-3} SnC_2O_4 solution is mixed with 50 cm^3 of 0.12 moldm^{-3} H^+/ $KMnO_4$?

1. 0.032 2. 0.008 3. 0.16 4. 0.016 5. 0.32

5) Which of the following could not be used to distinguish Ba $(NO_3)_2$ and Ba $(OH)_2$?

1. $K_2 Cr_2 O_{7(aq)}$ 2. $AgNO_{3(aq)}$ 3. $K_2CO_{3(aq)}$
4. $Mg(NO_3)_{2(aq)}$ 5. $(NH_4)_2 SO_{4(aq}$

6) In which of the following reactions both $\Delta H°$ and $\Delta S°$ are positive at 25 ℃?

1. $2H_{2(g)} + O_{2(g)} \longrightarrow 2H_2O_{(l)}$

2. $H_2O_{(l)} \longrightarrow H_2O_{(g)}$

3. $CO_{2(g)} + CaO_{(s)} \longrightarrow CaCO_{3(s)}$

4. $2SO_{2(g)} + O_{2(g)} \longrightarrow 2SO_{3(g)}$

5. $NH_{3(g)} + HCl_{(g)} \longrightarrow NH_4Cl_{(s)}$

7) Molecular formula of compound A is C_6H_{12}. It reacts with Br_2 to form compound B with molecular formula $C_6H_{12}Br_2$. When B is heated with alcoholic KOH compound with molecular formula C_6H_{10} is formed, which does not show optical isomerism and reacts with Cu_2Cl_2 / NH_3 to give a reddish brown precipitate. The compound A can be,

1. $CH_3 - \underset{\displaystyle HC = CH_2}{\overset{\displaystyle H}{\underset{|}{\overset{|}{C}}}} - CH_2CH_3$

2. $CH_3CH_2CH_2CH_2 - \overset{\displaystyle H}{\underset{|}{C}} = CH_2$

3. $CH_3CH_2CH_2CH = CH - CH_3$

4. $CH_3CH_2CH_2 - \overset{\displaystyle CH_3}{\underset{|}{C}} = CH_2$

5. $CH_3CH = \underset{\displaystyle CH_3}{\underset{|}{C}} - CH_2CH_3$

8) The effective nuclear charge felt by the valence electron in sodium (Na) is,
[Na z = 11 and relative atomic mass = 23]

1. equal to +11 *2.* equal to 23 *3.* less than +11

4. less than 23 *5.* greater than +11

9) Standard Gibbs energy changes for the reaction

$2\,CuO_{(s)} \rightarrow Cu_2O_{(s)} + \frac{1}{2}\,O_{2(g)}$

at two different temperatures are given below.

T/ K	$\Delta G^{\emptyset}$ / kJmol^{-1}.
1300	- 80.6
1200	- 60.4

The standard entropy of the reaction is,

1. 202 J K^{-1} mol^{-1} 2. – 202 J K^{-1} mol^{-1} 3. 40.2 J K^{-1} mol^{-1}

4. - 242 J K^{-1} mol^{-1} 5. 20.2 J K^{-1} mol^{-1}

10) A balloon is to be filled with a known amount of hydrogen gas at room temperature. At atmospheric pressure (100 KPa). The gas occupies 2.5 dm^3 volume. What would be the volume of the balloon when the pressure inside is 20 KPa at the same temperature?

1. 12.5 m^3 2. 12.5 dm^3 3. 25 dm^3 4. 50 dm^3 5. 2.5 dm^3

11) Which of the following produces an immediate precipitate with ammonical $AgNO_3$?

1. CH_3 CH = CH Cl *2.* $(CH_3)_3CCl$ *3.* C_2H_5Cl

4. $(CH_3CH_2)_2$ CHI *5.* C_6H_5I

12) Which of the following statements is false with regard to sulfur and its compounds?

1. Sulfur reacts with $H_2SO_{4(l)}$ giving SO_2 as one of the products.
2. dil H_2SO_4 can act as a strong acid and oxidizing agent.
3. SO_2 can act both as an oxidizing agent and as a reducing agent.
4. thiosulfuric acid can decompose to produce a sulphur and SO_2 products in aqueous solutions.
5. Sulfur is a metal with oxidation states in the range – 2 to 6.

13) 0.3 g of a mixture containing NaBr and KBr was dissolved in water and treated. In dil HNO_3 and aqueous $AgNO_3$. In the quantitative analysis, if 0.564 g and AgBr was formed, the mass percentage of KBr in the initial mixture is.

[K – 39 Na – 23 Br – 80 Ag – 108]

1. 22. 31 %
2. 20.40 %
3. 24.52 %
4. 30. 42 %
5. 21. 2 %

14) Which of the following statements is false with regard to NH_3 ?

1. NH_3 reacts with Mg to give $Mg_3 N_2$ and H_2 gas.
2. NH_3 gives a blue colour with red littmus paper.
3. NH_3 can act oxidizing agent.
4. NH_3 reacts with CuO to give Cu and H_2 gas.
5. NH_3 can act as acid and base.

15) The kinetic molecular theory equation for an ideal gas is $PV = \frac{1}{3} m N\overline{C^2}$. Which of the following statement is true for a sample of an ideal gas?

1. $\overline{C^2}$ increases with P at constant temperature.
2. PV is independent of the number of moles.
3. $\overline{C^2}$ is independent to temperature.
4. $\overline{C^2}$ increases if more molecules of the gas are introduced into the sample at constant temperature.
5. $\overline{C^2}$ is a constant at constant temperature.

❖ **For each of the question 16 to 20 one or more response out of four responses (a), (b), (c) and (d) given is / are correct. Select the correct responses / responses. In accordance with the instruction given on your answer sheet mark.**

1	2	3	4	5
Only (a) (b) are correct	Only (b) (c) are correct	Only (c) (d) are correct	Only (a) (d) are correct	The other numbers correct

16) Which of the following statements is / are false regarding the colours of complexes by 3d transition elements?

a) $[Zn(NH_3)_4]^{2+}$ is colourless
b) $[CuCl(OH_2)_5]^{+}$ is green
c) $[CrCl_6]^{3-}$ is blue – violet.
d) $[Fe(H_2O)_6]^{2+}$ is yellow – brown.

17) Which of the following statement is / are true.

a) $CH_3 CH = CH_2$ reacts with R_2O_2 / HI and gives the major product $CH_3 CH_2 CH_2 I$.
b) Alkenes react with cold, alkaline dilute $KMnO_4$ solution to produce diols.
c) Geometrical iosmers are diastereomers.
d) $CH_3 CH \equiv CH$ react with $NaNH_2$ and gives $CH_3 CH \equiv C Na$ and H_2 .

18) Which of the following reaction steps is/ are most unlikely to take place, when Cl_2 reacts with CH_4 in the pressure of light?

a) $CH_4 + Cl^{\bullet} \longrightarrow CH_3Cl + H^{\bullet}$
b) $CH_3Cl + Cl^{\bullet} \longrightarrow {}^{\bullet}CH_3 + Cl_2$
c) ${}^{\bullet}CH_3 + Cl^{\bullet} \longrightarrow CH_3Cl$
d) ${}^{\bullet}CH_3 + {}^{\bullet}CH_3 \longrightarrow C_2H_6$

19) $SO_{2(g)}$ reacts with $O_{2(g)}$ to produce 0.3 mol SO_3 with release of 28.8 kJ of heat. Which of the following statements is/are true for the above system? [S – 32 O – 16]

a) 96 kJ of heat is required to decompose one mole of $SO_{3(g)}$ into $SO_{2(g)}$ and 0.5 mol $O_{2(g)}$
b) 1.2 kJ of heat is required to form 8g of $SO_{3(g)}$.
c) reactants are more thermal stability than products.
d) Products are more thermal stability than reactants.

20) Which out of given radius variations is / are incorrect?

a) $K^+ > Ca^{2+}$ b) $O^{2-} > F^-$ c) $Mg^{2+} > S^{2-}$ d) $N > N^{3-}$

❖ **Instructions for questions *21 – 25.***

Response	First statement	Second statement
1)	True	True and correctly explains the first statement.
2)	True	True, but not explain the first statement correctly
3)	True	False
4)	False	True
5)	False	False

	First statement	Second statement
21)	Polarizing power of cation and the polarizibility of anoin is important in determining the covalent nature of a compound.	Ionic nature NaF > LiI
22)	All group I salts are soluble in water.	For almost all ionic solids of group I are soluble in water due to the negative Gibbs free energy in the solubility process.
23)	Water is an amphoteric compound.	Water has the ability to accept and release a proton.
24)	In the presence of Hg^{2+} and dilute dil H_2SO_4 add to an alkyne producing aldehydes or ketones.	Alkene reacts with Hg^{2+} / dil H_2SO_4 gives enol compound.
25)	Standard enthalpy change of sublimation is Na < K.	When the radii of cations increase, resulting in high metallic bonds strength.