FWC

G.C.E. A/L Examination March - 2019

Conducted by Field Work Centre, Thondaimanaru
In Collaboration with
Provincial Department of Education, Northern Province.

Grade :- 12 (2020)	Chemistry I	Time :- One hour

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 by selecting the most possible answer out of the given.**

1) Number of elements with melting point less than 25° C at 1 atm.

1. 5 2. 2 3. 11 4. 13 5. 15

2) The energy of the first energy level of H atom is $-2.18 \times 10^{-18}\ J$. The lowest wavelength line of Lyman series in H – emission spectrum.

1. 91 nm 2. 109 nm 3. 145 nm 4. 434 nm 5. 987 nm

3) Which of the following statement is true regarding Lithium?

1. Though Li react with steam, it does not react with hot water.
2. Li react with excess air at high temperature and produce Li_3N, Li_2O_2 and LiO_2.
3. Li_2CO_3 is thermally stable.
4. $LiHCO_3$ cannot be obtained at solid state.
5. Thermal decomposition of $LiNO_3$ produces $LiNO_2$ and O_2

4) Which one of the following is the most possible example for disproportionation reaction?

1. $K_2Cr_2O_7 + 3H_2SO_4 + 4HCl \longrightarrow 3K_2SO_4 + 3H_2O + 2CrO_2Cl_2$

2. $Fe_3O_4 + 8HCl \longrightarrow FeCl_2 + 2FeCl_3 + 4H_2O$

3. $NH_4NO_3 \xrightarrow{\Delta} N_2O + 2H_2O$

4. $2HCl + Na_2S_2O_3 \longrightarrow 2NaCl + S + SO_2 + H_2O$

5. $2H_2O_2 \longrightarrow 2H_2O + O_2$

5) The first five successive ionization energies of element X (in kJmol^{-1}) are 801, 2427, 3660, 25025, 32866 which of the following could be the formula of oxide of X?

1. XO 2. X_2O 3. XO_2 4. X_2O_3 5. X_2O_5

6) Correct increasing order of C – C bond length of the following.

1. $C_2H_2 < C_2H_4 < CH_3CN <$ Diamond
2. Diamond $< CH_3CN < C_2H_2 < C_2H_4$
3. Diamond $< C_2H_2 < CH_3CN < C_2H_4$
4. $C_2H_2 < CH_3CN < C_2H_4 <$ Diamond
5. $CH_3CN < C_2H_4 <$ Diamond $< C_2H_2$

7) When $CO_{(g)}$ is passed through Fe_2O_3 under hot conditions, part of Fe_2O_3 was converted to Fe_3O_4. Then this Fe_3O_4 was completely converted to FeO. If the mass of Fe_2O_3 taken was 16g and final mass was 15.6 g. What is the mass percentage of decomposed Fe_2O_3?
(Fe_2O_3 – 160 g mol^{-1}, FeO – 72 g mol^{-1})

1. 10 2. 25 3. 40 4. 50 5. 60

8) One mol of N_2H_4 forms the compound Y by removing 10 moles of Electrons. If all the N atoms in the initial compound are present in compound Y. What is the oxidation number of N atom in Y?

1. -3 2. -2 3. +1 4. +3 5. +5

9) Consider the following

A. The pressure of an ideal gas is always greater than the pressure of a real gas having equal volume, equal amount at same temperature.
B. Compressibility factor of a real gas is always lesser than that of an Ideal gas.
C. The unit of constant 'a' of Vander Waal's equation is Nm^4mol^{-2}.
D. Vander Waal's equation can't be used to an ideal gas.
E. Vander Waal's equation is given by $\left(P + \frac{n^2a^2}{v^2}\right)(v - nb) = nRT$.

Which of the above is / are true,

1. a, b and c 2. c, e 3. c only 4. e only 5. a, b

10) How many stable resonance structures are possible For N_2O_5?

1. 5 2. 3 3. 2 4. 4 5. 6

11) Consider the following tests & observation regarding a sodium piece kept exposed to atmosphere.

Tests	**Observation**
A. Added to cold water	• Gas evolution with hissing sound.
B. $BaCl_2$ added to resultant solution from A.	• White solid, soluble in dilute acids is obtained.
C. $Mg(NO_3)_2$ added to resultant solution from B.	• White solid residue obtained.

Relevant species corresponds to above test A, B & C.

1. $NaHCO_3$, Na, Na_2CO_3 2. Na_3N, $NaHCO_3$, Na_2CO_3 3. Na, Na_2CO_3, Na_3N
4. Na, Na_2CO_3, NaOH. 5. NaOH, Na, Na_2CO_3

12) 2.32 mg of Fe_3O_4 was dissolved well in H_2SO_4 and shaken well with KI for complete reaction. It was made up to $1dm^3$ by adding distilled water. The concentration of Fe^{2+} in ppm? (Fe-56, O - 16)

1. 1.12 2. 16.8 3. 1.68 4. 0.168 5. 11.2

13) The standard enthalpies of combustion of $C_{(s)}$, $H_{2(g)}$ and $C_2H_{6(g)}$ are -394 $kJmol^{-1}$, -284 $kJmol^{-1}$, -1540 $kJmol^{-1}$ respectively. The standard enthalpy of formation of $C_2H_{6(g)}$

1. -86 $kJmol^{-1}$ 2. -100 $kJmol^{-1}$ 3. + 100 $kJmol^{-1}$
4. + 86 $kJmol^{-1}$ 5. – 90 $kJmol^{-1}$

14) In which of the following groups the Atomic number and 2nd ionization energy are in increasing tendencies?

1. He, Li, Be 2. Be, B, Li 3. Be, B, C 4. Li, Be, B 5. C, N, O

15) When 10g of a solid mixture of CrO_3 and Cr_2O_3 is heated until a constant mass is obtained. Only Cr_2O_3 was obtained as the solid product. The loss in mass when heating is 1.92g. What is the mass percentage of Cr_2O_3 in solid mixture?

1. 10 2. 20 3. 40 4. 60 5. 80

❖ **Summary of instructions for question from 16 – 20.**

1	2	3	4	5
only a,b correct	only b,c correct	only c,d correct	only a,d correct	Any other answer

16) Root mean square velocity of ideal gases can be given by $\sqrt{\overline{C^2}} = \sqrt{\frac{3P}{d}}$ (d – density). Which of the following statement /s are true?

a) With increase of pressure velocity of ideal gas increases.

b) For different ideal gases under same temperature and pressure, speed varies.

c) Velocity of $H_{2(g)}$ at 50°C is higher than that of $O_{2(g)}$ at 100°C.

d) With increase of density of given gas, velocity of gas decreases

17) Which statements (s) is / are incorrect regarding K^+ and Cu^+?

a) Both have unpaired electrons.

b) Both have same nuclear charge.

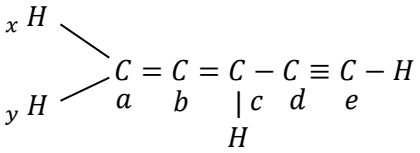
c) Ionic radius of K^+ is greater than Cu^+.

d) Electron affinity of Cu^+ is less than K^+.

18) In which of the Following the given enthalpy change is correctly described?

	Enthalpy change	**Relevant reaction**
a)	Standard enthalpy of sublimation of iodine	$I_{2(s)} \longrightarrow 2I_{(g)}$
b)	Standard enthalpy of combustion of $CH_3OH_{(l)}$	$2CH_3OH_{(l)} + 3O_{2(g)} \longrightarrow 2CO_{2(g)} + 6H_2O_{(l)}$
c)	Standard lattice enthalpy of $MgBr_{2(s)}$	$Mg^{2+}_{(g)} + 2Br^-_{(g)} \longrightarrow MgBr_{2(s)}$
d)	Enthalpy of atomization of $O_{2(g)}$	$O_{2(g)} \longrightarrow 2O_{(g)}$

19)



Consider the above compound, which of the following statement/s is / are correct.

a) There are 2 sp hybridized Carbon atoms, and 1 sp^2 hybridized Carbon atom.

b) Carbon atoms c, d, e are in straight line.

c) $H_x - C_a - H_y$ bond angle is approximately 120°.

d) Hydrogen atoms attached to Carbon atoms a and c are in same plane.

20) Which of the following is/are intensive property?

a) Heat capacity.

b) Activation energy.

c) Electric potential.

d) Mass

❖ **Following the introduction given for question21 – 25.**

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

	First Statement	Second Statement
21.	By heating of Lithium Carbonate, Li_2O and CO_2 are obtained as products.	On heating of Group IA metal carbonates, their respective metal oxides can be obtained.
22.	Compressibility of an ideal gas can be given as $Z = \frac{PV}{nRT}$.	$NH_{3(g)}$ does not behave as an ideal gas at high pressure and low temperature.
23.	AlF_3 is an ionic compound, but $AlCl_3$ is a covalent compound.	Radius of F^- is less than radius of $Cl^-$and the polarizing power of F^- is greater than Cl^-
24.	C_2F_4 Molecule has polar bonds.	Planar molecules are nonpolar.
25.	Spontaneous reactions occurring in an isolated system always take place with an increasing entropy.	The overall effect of ΔH and ΔS is given by the Gibb's free energy change ΔG as $\Delta G = \Delta H + T\Delta S$.