



FWC

G.C.E. A/L Examination July - 2015

Conducted by Field Work Centre, Thondaimanaru

In Collaboration with

Zonal Department of Education Jaffna.

Grade :- 12 (2016)

CHEMISTRY

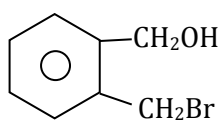
Time :- 3 Hours

- 01)** The compound whose molecule has the smallest bond angle among them is
 1) SO_2 2) H_2O 3) H_2S 4) NH_3 5) CF_4
- 02)** Which of the following is the most suitable Lewis structure for CNO^- ion
 1) $\ddot{N}^{(-)} = C = \ddot{O}$ 2) $\ddot{N} \equiv C - \ddot{O}^{(-)}$ 3) $^{2-}\ddot{N} - ^{2+}C - \ddot{O}^{(-)}$
 4) $\ddot{C} = ^{2+}N - \ddot{O}^{(-)}$ 5) $\ddot{O} = N^+ - \ddot{C}^{2-}$
- 03)** Mass of an atom of element B is five times the mass of an atom of element A. If the mass of an atom of B is 3 times the mass of an atom of $^{12}_6C$ isotope, the relative atomic mass of A is
 1) 180 2) 36 3) 18 4) 14.4 5) 7.2
- 04)** The number of enantiomer pairs among the mono – chloro substituted products formed in the reaction of 2 – methylbutane with Cl_2 in the presence of diffused light is
 1) 2 2) 3 3) 4
 4) 6 5) None of the above
- 05)** Which of the following compounds may be used for preparing Grignard's reagent by treating it with Mg?
- 1) $HC \equiv C - CH_2CH_2Cl$

2) $CH_2 = CH - CH_2Br$

5) $CH_3 - \underset{\substack{| \\ I}}{CH} - CH_2 - C \begin{matrix} \nearrow O \\ \searrow H \end{matrix}$

2) $CH_3 - \overset{\overset{O}{||}}{C} - CH_2Br$

4) 
- 06)** When boiled with conc. HNO_3 an inorganic salt Y produced a dark coloured gas. The solution obtained above gave a white precipitate with $BaCl_{2(aq)}$ The salt Y could be
 1) $CuBr$ 2) Ag_2CO_3
 3) CuI 4) AgI 5) PbO

07) The composition of $NaOH$ in a $250cm^3$ solution prepared by dissolving a particular mass of $NaOH$ in water was found to be $5 \times 10^3 ppm$. The mass of $NaOH$ dissolved is ($Na = 23, O = 16$)

- 1) $4g$ 2) $2g$ 3) $1.25g$
4) $1g$ 5) None of the above

08) The cation that

- i) Produces a black precipitate with H_2S in the presence of OH^-
ii) does not produce a precipitate with H_2S in dil HCl and
iii) forms a blue coloured solution with concentrated $NH_{3(aq)}$ is

- 1) Cu^{2+} 2) Mn^{2+} 3) Co^{2+} 4) Ni^{2+} 5) Fe^{2+}

09) Which one of the following compounds exhibits both enantiomer and diastereoisomerisms?

- 1) $CH_3CH = CH - CH_2CH_3$ 2) $CH_3CH = CH - \underset{\substack{| \\ COOH}}{CH} - CH_3$
3) $CH_3\underset{\substack{| \\ Cl}}{CH} - CH = CH_2$ 4) $CH_3 - \underset{\substack{| \\ OH}}{CH} - CH_2CH_3$
5) $CHF = CH - \underset{\substack{| \\ CH_3}}{CF_2}$

10) $500 ml$ of a $NaOH$ solution of concentration $4 mol dm^{-3}$ has a density of $1.6 g cm^{-3}$. The mole fraction of $NaOH$ in the solution ($Na = 23, O = 16, H = 1$)

- 1) $\frac{1}{21}$ 2) $\frac{2}{21}$ 3) $\frac{20}{21}$ 4) $\frac{1}{2}$ 5) $\frac{1}{4}$

11) Consider the following statements regarding 1 – butyne

- a) It forms an aldehyde when treated with dil. $di\ell H_2SO_4 / HgSO_4$
b) It produces $NH_{3(g)}$ when reacting with $NaNH_2$
c) The product formed when it reacts with $H_2 / Lindlar catalyst$ does not exhibit stereo isomerism.
d) In its molecule, three carbon atoms are linear

Which of the above statements are true

- 1) a, b, c only 2) b, c, d only 3) c, d only
4) a, c, d only 5) c only

12) An organic compound A reacts with Br_2 / CCl_4 to form a product B. The product obtained when B is treated with C_2H_5OH / KOH gives a reddish brown precipitate with NH_3 / Cu_2Cl_2 . The compound which has the possibility to be A

- 1) $CH_3 - \underset{\substack{| \\ CH_3}}{C} = CH_2$ 2) $CH_3CH = CH - CH_3$ 3) $CH_3 - \underset{\substack{| \\ CH_3}}{C} = \underset{\substack{| \\ CH_3}}{C} - CH_3$
4) $CH_3CH_2CH = CH_2$ 5) None of the above

- 13) Given that the average bond energy values of the bonds $C-H$, $C-C$, $C=C$ and $H-H$ at 298 K are 414, 347, 615, and 435 $KJmol^{-1}$

The enthalpy change for the reaction $CH_2 = CH_2 + H_2 \rightarrow CH_3CH_3$ is

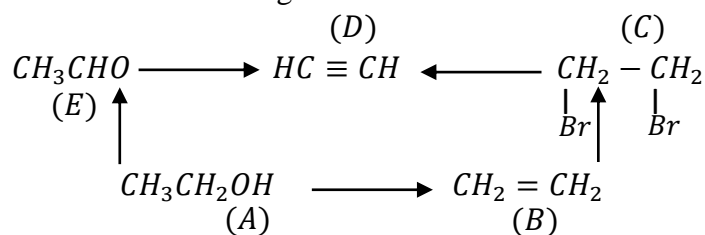
- 1) +250kJ
 - 2) -250kJ
 - 3) +125kJ
 - 4) -125kJ
 - 5) None of the above
- 14) Which of the following statements regarding the elements in the periodic table is false
- 1) Group 14 consists of the three types metals, non – metals and metalloids
 - 2) Periods 4, 6 contain elements of all the 3 physical states solid, liquid and gas at $25^{\circ}C$
 - 3) All the uni-valent elements are metals
 - 4) Group 17 contain elements of all the 3 physical states – solid, liquid and gas
 - 5) In general, d – block elements have higher melting points than s – block elements
- 15) In acidic medium, VO_3^- ions are reduced to VO^{2+} ions. In the balanced equation for the above reaction, the correct stoichiometric coefficients of H^+ ions and electrons are respectively
- 1) 1,4
 - 2) 4, 1
 - 3) 2, 1
 - 4) 5, 1
 - 5) 5, 2

❖ Summary of above Instructions for question no. 16 - 20

1	2	3	4	5
Only (a) and (b) correct	Only (b) and (c) correct	Only (c) and (d) correct	Only (d) and (a) correct	Any other response or combination of responses correct.

- 16) In the hydrogen halides HF, HCl, HBr and HI which of the following properties decreases / decrease in the given order of the species?
- a) Boiling point
 - b) Reducing ability
 - c) Thermal stability
 - d) Dipole moment
- 17) With which of the following does H_2O_2 act as an oxidizing agent?
- a) MnO_4^- / H^+
 - b) Cr^{3+} / in OH^- Medium
 - c) Water suspension of Pbs
 - d) MnO_2

18) Consider the following reaction scheme



The correct statement / Statements regarding the above is / are

- Al_2O_3/Δ may be used for the conversion of A into B
 - $Br_{2(aq)}$ can be used to convert B into C
 - $dilH_2SO_4/HgSO_4$ can be used to obtain E from D
 - E can be obtained by adding PCC / CH_2Cl_2 to A
- 19) A gaseous mixture containing H_2 and CH_4 gases has a density of $0.6 kg m^{-3}$ at 300K and under a pressure of $3 \times 10^5 Nm^{-2}$. Assuming ideal behavior of gases, which of the following is / are true?
- The mole fraction of H_2 in the mixture is $11/14$
 - The average molar mass relevant to the gas mixture is approximately $5 g mol^{-1}$
 - The partial pressure of CH_4 in the mixture is $3/14 \times 10^5 Nm^{-2}$
 - Even if the temperature of the system is changed to 500K, the density of the mixture remains the same as $0.6 kg m^{-3}$
- 20) Which of the following contains / contain species of almost the same colour?
- $Ag_2CrO_4, PbCrO_4, BaCrO_4$
 - $[FeCl_4]^- , [NiCl_4]^{2-} , [CoCl_4]^{2-}$
 - Dry $CuCl_2, CdS, As_2S_3$
 - $[Cu(NH_3)_4]^{2+} , [Cr(NH_3)_6]^{3+} , [Ni(NH_3)_6]^{2+}$
- ❖ Summary of instructions for question 21 - 25

Statement - I	Statement - II
1) True	True and correctly explains statement I
2) True	True but does not explain statement I
3) True	False
4) False	True
5) False	False

	Statement I	Statement II
21)	Acetalene is more reactive than ethane	$C \equiv C$ bond energy is greater than $C - C$ bond energy
22)	Endothermic reactions occurring with a decrease in entropy cannot be spontaneous at any temperature	A reaction is spontaneous if only the Gibb's free energy change is negative
23)	Aqueous solution of NH_3 cannot be used for distinguishing Cu^{2+} , and Ni^{2+} solution	Both Cu^{2+} and $Ni_{(aq)}^{2+}$ form deep blue complex with excess NH_3 solution.
24)	$NH_3 / AgNO_3$ cannot be used for differentiating 1- butyne and 2 - butyne	Both 1 – butyne and 2 – butyne give the same product with $dil H_2 SO_4 / HgSO_4$
25)	The boiling point of 2 - methylbutane is greater than that of 2 – 2 dimethy / propane	The strength of London forces decrease when the number of branches increases in the isomers of alkanes having the same molecular formula.