KK12C

Kanniyakumari District
Common Half Yearly Examination - 2023

Standard 12
CHEMISTRY

Time: 3.00 Hours Marks: 70

Note: Draw diagrams and write equations wherever necessary.

Part - I

Note: 1. Answer all the questions **15×1=15**

2. Choose the most suitable answer from the given four alternatives.

1) The method employed to remove the impurities with high melting from metals having low melting points
   a) Distillation b) Zone refining
   c) Liquation d) Electrolytic refining

2) The stability of +1 Oxidation state increases in the sequence
   a) Al < Ga < In < Tl b) Tl < In < Ga < Al
   c) In < Tl < Ga < Al d) Ga < In < Al < Tl

3) Which of the following oxoacids of Sulphur contains S – S double bond
   a) $H_2S_2O_8$ b) $H_2S_2O_6$ c) $H_2S_2O_3$ d) $H_2S_2O_7$

4) The actinoid elements which show the highest Oxidation state of +7 are
   a) NP, PU, Am b) U, FM, Th c) V, Th, Md d) Es, NO, Lr

5) An explosion takes place when cold con:H_2SO_4 is added to $KMnO_4$ which of the following is formed
   a) Mno_2 b) $MnSO_4$ c) Mn_2O_3 d) Mn_2O_7

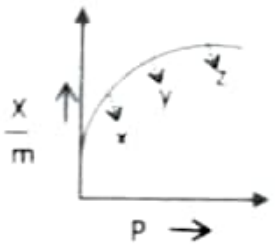
6) What is the Co-ordination number and Charge of the central metal ion in the complex $Na_2[Ni(EDTA)]$
   a) 2, +2 **b) 4, +4** **c) 6, +2** **d) 6, +4**

7) The vacant space in bcc lattice unit cell is
   a) 48% b) 23% c) 26% d) 32%

8) Which of the following can act as Lowry - Bronsted acid as well as base?
   a) HCl b) SO_4^{2-} c) HPO_4^{2-} d) Br^-

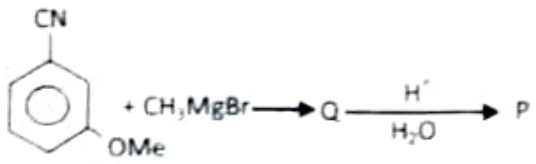
9) **Assertion** : Pure iron when heated in dry air is converted with a layer of rust
   Reason : Rust has the composition Fe_3O_4
   a) If both assertion and reason are true and reason is the correct explanation of assertion
   b) If both assertion and reason are true but reason is not the correct explanation of assertion
   c) assertion is true but reason is false
   d) both assertion and reason are false

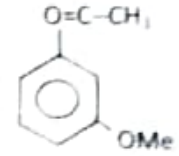
10) In the following graph the point at which $\frac{x}{m} \propto P^1$ is

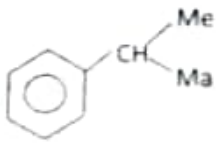


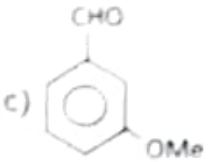
   a) y b) x
   c) z d) Both x, z

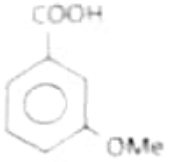
11) In the given reaction the product "P" is



a) 

b) 

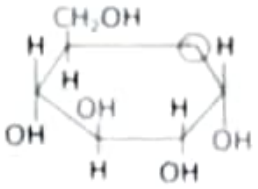
c) 

d) 

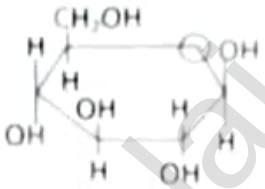
12) Carboxylic acids have higher boiling points than aldohydes, ketones and even alcohols, of comparable molecular mass, It is due to their
a) more extensive association of Carboxylic acid via Vander waals force of attraction
b) formation of Carboxylate ion
c) formation of intermolecular H-bonding
d) formation of Intramolecular H-bonding

13) Which one of the following is most basic
a) 2, 4 - dichloro aniline
b) 2, 4 - dimethyl aniline
c) 2, 4 - dinitro aniline
d) 2, 4 dibromoaniline

14) Study the structure of α-D-Glucose (i) and β-D-Glucose (ii) and mark the correct statement



Structure -(i)



Structure -(ii)

a) Structure (i) and (ii) are enantiomers
b) Structure (i) and (ii) are anomers
c) Structure (i) and (ii) differ in configuration of C_1 and C_4
d) Both the structure (i) and (ii) gives 2, 4 DNP test

15) Nylon is an example of
a) Polyamide
b) Polythene
c) Polyester
d) Polysaccharide

Part - II

Answer any six questions. Q.No. 22 is compulsory. **6×2=12**

16) Explain the following terms with suitable examples. a) Gangue b) Slag
17) Give any three characteristics of Ionic Crystals
18) Powdered Calcium Carbonate reacts much faster with dil:HCl than with the same mass of $CaCO_3$ as marble. Give reason.
19) Calculate the pH of 1.5×10^{-3} m solution of $Ba(OH)_2$
20) Arrange the following solultions in the decreasing order of specific conductance
i) 0.01 m KCl ii) 0.005 m KCl iii) 0.1 m KCl iv) 0.5 m KCl
21) When Chloroform is exposed to air it forms a poisonous compound? How to avoid it
22) Find x, y, z

$$CH_3NH_2 + CHCl_3 + KOH \rightarrow X \xrightarrow[H_2O]{HCl} Y + Z$$

23) What is glacial acetic acid?
24) What are bio-degradable polymer? Give an example

Part - III

Answer any six questions. Q.No. 33 is compulsory. **6×3=18**

25) Give three uses of Helium
26) Discuss briefly the nature of bonding in metal Carbonyls.

27) In which type of reaction Rate is equal to rate constant. Derive Rate constant for that

28) Define enzymes? What is the most important reason for their specific action

29) Explain the function of $H_2 - O_2$ fuel cell

30) What happens when diethyle ether reacts with

a) dil: H_2SO_4 b) PCl_5 c) Cl_2(light)

31) Explain - Reducing action of formic acid

32) Write the differences between DNA and RNA

33) An important Ore (A) of a metal with electronic configuration $[Ar]3d^54S^1$ reacts with weak alkali and air in the presence of lime forms yellow compound (B). Which on acidification gives Orange red compound [C]. Which on treatment with alkalimetal halide forms an Orange compound (D). Identify A, B, C and D

Part - IV

Answer all the questions. **5×5=25**

34) a) Explain Zone refining process. (5m)

(OR)

b) i) How will you convert boric acid to boron nitride (2m)

ii) Explain the bleaching action of SO_2. (3m)

35) a) Write the differences between Lanthanoids and actinoids

(OR)

b) i) Explain the following Isomersim with example

1. Linkage Isomerism 2. Co-ordination Isomerism (3m)

ii) Write are the limitations of VB theory (2m)

36) a) i) Write short note on metal deficiency defect with an example. (3 m)

ii) The rate of the reaction $x + 2y \rightarrow$ product is 4×10^{-3} mole $L^{-1} S^{-1}$ if $[x] = [y] = 0.2m$ and rate constant at 400 k is $2 \times 10^{-2} S^{-1}$, what is the over all order of the reaction. (2m)

(OR)

b) i) What is common ion effect with example (3m)

ii) Give the medicinal application of colloids. (2m)

37) a) Convert the following

i) Glycol to 1,4 dioxan

ii) Glycerol to nitroglycerine

iii) Phenol to phenolophthalein (5m)

(OR)

b) i) How to prove

1) Fructose containing 5 hydroxyl group

2) Six Carbon in stright chain

3) Presence of Keto group (3 m)

ii) What is Chloropicrin? Give its use. (2m)

38) Explain a) i) Levine and Hauser reaction

ii) Gomberg reaction

iii) Popoff's rule (5m)

(OR)

b) [A] Simplest aromatic hydrocarbon reacts with con: HNO_3 / H_2SO_4 forms (B). [B] reacts with Sn/HCl forms [C]. which on reacts with $NaNO_2$/HCl at 273 - 278 k forms [D]. Which on further react with $H+/H_2O$ forms [E] which gives violet colour with Neutral $FeCl_3$. Identify A, B, C, D and E. Explain the reactions. (5m)

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