Roll Number		

SET A

INDIAN SCHOOL MUSCAT
FINAL TERM EXAMINATION
CHEMISTRY

CLASS: XII | Sub. Code: 043 | Time Allotted: 3 Hrs

11.11.2018 | Max. Marks: 70

General Instructions:

a) *All questions are compulsory.*
b) *Section A: Q.no. 1 to 5 are very short answer questions and carry 1 mark each.*
c) *Section B: Q.no. 6 to 12 are short answer questions and carry 2 marks each.*
d) *Section C: Q.no. 13 to 24 are also short answer questions and carry 3 marks each.*
e) *Section D: Q.no. 25 to 27 are long answer questions and carry 5 marks each.*
f) *There is no overall choice. However an internal choice has been provided in two questions of one mark, two questions of two marks, four questions of three marks and all the three questions of five marks weightage. You have to attempt only one of the choices in such questions.*
g) *Use of log tables if necessary, use of calculators is not allowed.*

Section -A

1. The dissolution of ammonium chloride in water is an exothermic process, but still it dissolves in water readily. Why? 1

OR

Addition of mercuric iodide to an aqueous solution of KI shows increase in vapour pressure. Why?

2. Allyl cholride can be distinguished from Vinyl chloride by NaOH and silver nitrate test. Comment. 1

3. How much charge in Faradays is required for the reduction of 1 mol of Al^{3+} to Al. 1

OR

The products of electrolysis of aqueous NaCl at the respective electrodes are :
Cathode : H_2 ,Anode : Cl_2 and not O_2. Explain.

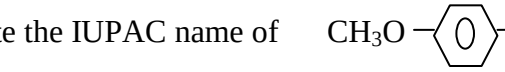
4. Define the term antagonists. 1

5. What is Hinsberg reagent. Give its use. 1

Section -B

6. What is the basic structural difference between 2
   a) DNA and RNA

b) α-D glucose and β-D glucose

7. a) Write the IUPAC name of  2

b) Draw the structure of Di-Sec-butylketone.

8. Write short note on 2
   a) Zaitsev rule
   b) Racemisation

OR

Explain the following with example
   a) Wurtz Fittig reaction
   b) Freons

9. a) For a reaction A + B →Products, the rate law is given by $r = k\,[A]^{1/2}\,[B]^{2}$ What is the order of reaction. 2
   b) The conversion of molecule X to Y follows second order kinetics. If concentration of X is increased to three times how will it affect the rate of the reaction?

10. How do we separate two sulphide ores by froth floatation process? Explain with an example. 2

11. a) Give a chemical test to distinguish aniline and N-methyl aniline. 2
   b) Arrange the following in decreasing order of pK_b values :
   $C_2H_5NH_2$, $C_6H_5NHCH_3$, $(C_2H_5)_2NH$ and $C_6H_5NH_2$

OR

Write the structures of main products when benzene diazonium chloride reacts with the following reagents
   (i) $H_3PO_2 + H_2O$
   (ii) CuCN/KCN

12. What is the difference between thermosetting polymers and thermoplastics. Give one Example of each type 2

Section -C

13. Account for the following 3
   a) Frenkel defects are not found in alkali metal halides.
   b) The electrical conductivity of a metal decreases with rise in temperature.
   c) Impurity doped silicon is a semiconductor.

14. The density of lead is 11.35 g/cm^{3}and the metal crystallises with fcc unit cell. Estimate the radius of lead atom. 3

(GAM of lead =207g/mol)

15. a) What are azeotropes? 3
   b) What type of deviation is shown by a mixture of ethanol and acetone? Give reason

c) Gas (A) is more soluble than gas (B)at the same temperature. Which of the two gases will have higher value of K_H and why?

16. The freezing point of a solution containing 0.3g of acetic acid in 30 g benzene is lowered by 0.45^0C. Calculate Van't Hoff factor .(Kf for benzene = **5.12** K kg mol^{-1}) 3

OR

The vapour pressures of pure liquids A and B are 450 and 750 mm of Hg at 350 K respectively. Find out the composition of the liquid mixture if total vapour pressure is 600mm of Hg. Also find the composition of the vapours of these liquids in vapour phase.

17. a) Write the chemical reactions involved in the process of extraction of Gold. 3
    b) Write the role of cryolite in the electrolytic reduction of alumina.

18. Suggest a mechanism for the dehydration of ethanol using conc.H_2SO_4 at 413K. 3

OR

Give reason for the following observations

a) Phenol is less acidic than 2-Fluoro phenol
b) Tert-butanol is more volatile than n-butanol
c) Di-tert-butyl ether cannot be prepared by Wiliamsons synthesis.

19. Account for the following : 3
    a) Primary amines (R-NH_2) have higher boiling point than tertiary amines (R_3N).
    b) Aniline does not undergo Friedel – Crafts reaction.
    c) $(CH_3)_2NH$ is more basic than $(CH_3)_3N$ in an aqueous solution

20. Write equations for the following name reactions: 3
    a) Gattermann - Koch reaction.
    b) Stephen reaction.
    c) Hell Volhard Zelinsky reaction

21. a) Name the common types of secondary structure of proteins and give one point of difference. 3
    b) What are the expected products of hydrolysis of lactose?

22. What happens when 3
    a) Chlorobenzene is subjected to hydrolysis
    b) Propene is treated with Cl_2 in the presence of U.V. light / heated.
    c) Alkyl chlorides when treated with NaI in dry acetone

23. Write the name and structures of the monomers of 3
    a) PHBV
    b) Nylon 6,6
    c) PVC

OR

a) Give an example of a synthetic rubber.
b) Mention any two advantages of synthetic rubber.
c) Arrange the polymers in the increasing order of tensile strength.
Nylon-6, Buna-S, Polythene.

24. a) Pick the odd one out from the following list and state the reason 3
Chloramphenicol, Penicillin, Tetracycline, Vancomycin
b) Mention one important use of each of the following
(i) Equanil (ii) Sucralose

OR

Define with one example each:
a) Analgesics
b) Antacids
c) Cationic detergents

Section -D

25. a) What is a primary cell? 5
b) Write the chemistry of recharging the lead storage battery.
c) The Conductivity of $2.5x10^{-4}$ M methanoic acid is $5.25x10^{-5}Scm^{-1}$Calculate its molar conductivity and degree of dissociation.
Given $\lambda^o (H^+)=394.5$ S cm^2mol^{-1} and $\lambda^o(HCOO^-)=50.5$ Scm^2mol^{-1}

OR

a) State Faraday's first law of electrolysis.
b) Write any two factors which affect the formation of products during electrolysis.
c) The cell in which the following reaction occurs
$2Fe^{3+}$ (aq) + $2I^-$ (aq) → $2Fe^{2+}$ (aq) + I_2 (s) has E^0_{cell} = 0.236 V at 298 K. Calculate standard Gibbs energy and equilibrium constant of the cell reaction.

26. a) Define 5
(i) Collision frequency
(ii) Rate constant
b) The reaction , SO_2Cl_2 (g) →SO_2 (g) + Cl_2 (g) is a first order reaction with $k=2.2 x10^{-5} s^{-1}$ at 320^0C.Calculate the percentage of SO_2Cl_2 that would be decomposed on heating at 320^0C for 90 minutes.

OR

a) Define
(i) pseudo first order reaction
(ii) Molecularity

b) The decomposition of A→ B+C has the following rate law, rate=k [A]. The rate constant at 273 K is $7.87x 10^{-7}s^{-1}$ and the activation energy is 103 KJ/mole. Calculate the rate constant at

293 K. (R=8.314 J/k mol)

27. a) Convert 5

(i) Ethanal to But-2-enal

(ii) Benzoic acid to benzaldehyde

b) (A), (B) and (C) are three non-cyclic functional isomers of carbonyl compound with molecular formula C_4H_8O.Isomers (A) and (C) give positive Tollens' test whereas isomer (B) does not give Tollens' Test but gives positive Iodoform test. Isomers (A) and (B) on reduction with Zn(Hg)/cons.HCl give the same product (D).

(i) Write the structures of (A), (B), (C) and (D)

(ii) Out of (A), (B) and (C) isomers, which one is least reactive towards addition of HCN?

OR

a) Which one of the following will undergo Cannizzaro reaction and why?

((i) $(CH_3)_3CCHO$ (ii)$(CH_3)_2CHCHO$

b) Predict the products of the following reactions

$$C_6H_5COCH_3 \xrightarrow[NaOH/I_2]{}$$

(i) $CH_3COCH_2COOC_2H_5 \xrightarrow{NaBH_4/H^+}$

c) Account for the following :

(i) $Cl - CH_2COOH$ is a stronger acid than CH_3COOH.

(ii) Sodium bisulphite is used for the purification of aldehydes and ketones

End of the Question Paper