Roll Number		

SET C

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. How much charge in Faradays is required for the reduction of 1 mol of Cu^{2+} to Cu. 1

OR

Name the products of electrolysis of aqueous NaCl at different electrodes.

2. Define the term receptors. 1

3. What is Hinsberg reagent. Give its use 1

4. 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?

5. Which compound in each of the following pair will react faster in S_N1 reaction? 1
$CH_3CH=CHCl$ or $CH_2=CHCH_2Cl$

Section -B

6. a) Write the IUPAC name of the following 2
$C_6H_5CH(OH)CH_2CH=CHCH_3$

b) Draw the structure of 3-Isobutyl-2-oxocyclohexanecarbaldehyde.

7. Explain the following 2
   a) Peptide linkage
   b) Pyranose structure of α- D (+)glucose
8. a) For a reaction $A + H_2O \rightarrow B$; $r = k[A]$. What is its (i) Molecularity (ii) Order? 2
   b) The conversion of molecule X to Y follows second order kinetics. If concentration of X is doubled how will it affect the rate of the reaction?

9. Explain the thermodynamic principles of metallurgy. 2

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

OR

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

11. a) Give a chemical test to distinguish aniline and N-methyl aniline. 2
    b) Arrange the following in decreasing order of pKb 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
   a) $H_3PO_2 + H_2O$
   b) CuCN/KCN

12. What is the difference between elastomers and fibres. Give one example of each type. 2

Section - C

13. The freezing point of a solution containing 0.3 g of acetic acid in 30 g benzene is lowered by 0.45^0C. Calculate Van't Hoff factor. (K_f 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.

14. a) Why water cannot be separated completely from ethyl alcohol by fractional distillation? 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?

15. 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

16. 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

17. Outline the principles of refining of metals by the following methods : 3

a) Zone refining
b) Electrolytic refining
c) Vapour phase refining

18. 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)

19. 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

20. Write equations for the following name reactions: 3

a) Gattermann - Koch reaction.
b) Stephen reaction.
c) Hell Volhard Zelinsky reaction

21. a) What are the expected products of hydrolysis of lactose? 3
b) Explain essential amino acids with one example
c) Give one structural difference between amylose and amylopectin.

22. Write the name and structures of the monomers of 3

a) Nylon-2,6
b) PAN
c) Neoprene

OR

a) Explain why Sulphur is added during vulcanization of rubber?
b) Give any two uses of PHBV
c) Classify the following as condensation and addition polymers Terylene, Bakelite, PVC, Polythene

23. a) List two major classes of antibiotics 3
b) Give two examples of artificial sweetners
c) Why are Cimetidine and ranitidine better antacids than sodium hydrogen carbonate or magnesium hydroxide?

OR

Define the following
a) Tranquilizers
b) Competitive inhibitors
c) Antihistamines

24. Account for the following : 3
a) Aromatic amines are less basic than aliphatic amines
b) Acetylation of aniline reduces its activation effect
c) Nitration of aniline gives substantial amount of m-nitro aniline

Section -C

25. 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

(i) $C_6H_5COCH_3 \xrightarrow{NaOH/I_2}$

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

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

26. 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 $5.25x10^{-5}Scm^{-1}$ .Caculate its molar conductivity and degree of dissociation.
Given $\lambda^o(H^+)$=394.5S 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

$2Fe^{3+}(aq) + 2I^{-}(aq) \rightarrow 2Fe^{2+}(aq) + I_2(s)$ has $E^0_{cell} = 0.236$ V at 298 K.

Calculate standard Gibbs energy and equilibrium constant of the cell reaction

27. a) Define 5

(i) Collision frequency

(ii) Rate constant

b) The reaction , $SO_2Cl_2(g) \rightarrow SO_2(g) + Cl_2(g)$ is a first order reaction with $k=2.2 \times 10^{-5}\ s^{-1}$ 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 $7.87 \times 10^{-7} s^{-1}$ and the activation energy is 103 KJ/mole. Calculate the rate constant at 293 K. (R=8.314 J/k mol)

End of the Question Paper