



INDIAN SCHOOL MUSCAT
FIRST PRELIMINARY EXAMINATION 2017
CHEMISTRY

CLASS: XII

Sub. Code: 043

Time Allotted: 3 Hrs

12.12.2017

Max. Marks: 70

General Instructions:

- All questions are compulsory
- Mark for each question is indicated against it.
- Question numbers 1 to 5 are very short answer questions and carry one mark each.
- Question numbers 6 to 10 are short answer questions and carry two marks each.
- Question numbers 11 to 22 are short answer questions and carry three marks each.
- Question number 23 is a value based question and carry four marks.
- Question numbers 24 to 26 are long answer questions and carry five marks each.

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|--|--|---|
| 1. | How many Faradays of charge are required to convert 20 g of Ca from molten CaCl_2 ?
(RAM of Ca=40 u) | 1 |
| 2. | A reaction is second order with respect to a reactant A. How is the rate of this reaction altered if the concentration of A is reduced to half ? | 1 |
| 3. | Write any two consequences of Lanthanoid contraction. | 1 |
| 4. | Give the structure of N-Ethyl-N-methylpropanamine | 1 |
| 5. | Write the IUPAC name of | 1 |
|  | | |
| 6. | Describe the manufacture of KMnO_4 from Pyrolusite. | 2 |
| 7. | a) Reduction of metal to metal oxide becomes easier if the metal obtained is in liquid state. Why?
b) Write the principle of froth floatation method. | 2 |
| 8. | Define
a) Peptization
b) Zeta potential | 2 |

OR

Write chemical equations for the preparation of:

- a) Gold sol by reduction. b) Hydrated ferric oxide sol by hydrolysis

9. a) Which would undergo S_N2 reaction faster in the following pair and why?

2



b) Racemisation occurs in S_N1 reactions. Account.

10. a) Give a chemical test to distinguish between dimethylamine and trimethyl amine.

2

b) Give the formula of the compound obtained by Hofmann degradation reaction of 4-chlorocyclohexane carboxamide.

11. Explain giving reasons:

3

a) E⁰ value for Mn³⁺/Mn²⁺ is more positive than that for Cr³⁺/Cr²⁺.

b) Actinoids exhibit more number of oxidation states than Lanthanoids.

c) MnO is basic while Mn₂O₇ is acidic.

12. a) State Hardy-Schulze rule

3

b) Explain the term selectivity of a catalyst with example

c) What will happen if Fe(OH)₃ and As₂S₃ sols are mixed? Give reason.

13. a) Complete the following reaction

3



b) Convert

(i) Phenol to benzoquinone

(ii) Methanal to propan -1-ol

14. Describe the role of

3

a) NaCN in the extraction of gold from its ore.

b) Cryolite in the extraction of aluminium from pure alumina.

c) CO in the purification of Nickel

15. a) On the basis of crystal field theory ,write the electronic configuration for d⁴ ion , if Δ₀< P.

3

b) Identify the type of isomerism shown by the complex Cr(H₂O)₆Cl₃ .

c) Write the hybridization and magnetic behaviour of the complex [CoF₆]³⁻

(Atomic no of Co =27)

16. Discuss the nature of bonding in metal carbonyls.

3

OR

a) Write the IUPAC name of the complex K₃[Fe(C₂O₄)₃].

b) Explain the following

(i) Denticity

(ii) Spectrochemical series

17.	Explain why	3
a)	Alkyl amines are more basic than ammonia.	
b)	Diazonium salts of aromatic amines are more stable than those of aliphatic amines	
c)	Aniline does not undergo Friedel -Crafts reaction.	
18.	a) Name the reagents used in the following reactions	3
(i)	Benzyl alcohol to benzoic acid	
(ii)	Dehydration of propan -2-ol to propene	
b)	Account for the following	
(i)	The C-O-H bond angle in alcohols is slightly less than tetrahedral angle.	
(ii)	The boiling points of ethers are lower than isomeric alcohols	
19.	a) What is the difference between	3
(i)	Nucleoside and Nucleotide?	
(ii)	Glycosidic linkage and Peptide linkage.	
b)	Two strands of DNA are complimentary and not identical. Why?	
20.	Write short note on	3
(i)	Secondary structure of protein	
(ii)	Invert sugar	
(iii)	Anomers	
21.	Justify the following statements:	3
(i)	Chlorine is deactivating but ortho,para directive.	
(ii)	Bromoethane gives nitroethane when reacted with silver nitrite.	
(iii)	N-butyl bromide has higher boiling point than tert-butyl bromide	
22.	a) Arrange the following compounds in the increasing order of their boiling points :	3
	CH_3CHO , $\text{CH}_3\text{CH}_2\text{OH}$, CH_3OCH_3 , CH_3COOH	
b)	Account for the following :	
(i)	Propanal is more reactive than propanone towards nucleophilic reagents.	
(ii)	Carboxylic acids do not give characteristic reactions of carbonyl group.	
23.	Ashwin observed that his friend Shubham was staying aloof, not playing with friends and becoming easily irritable for some weeks. Ashwin told his teacher about this, who, in turn, called Shubham's parents and advised them to consult a doctor. Doctor after examining Shubham, prescribed antidepressant drugs for him.	4
(i)	Name two antidepressant drugs.	
(ii)	Mention the values shown by Ashwin.	
(iii)	How should Shubham's family help him other than providing medicine?	
(iv)	What is the scientific explanation for the feeling of depression?	

24. a) Give simple chemical test to distinguish between the following pairs of compounds : 5

- (i) Acetophenone and benzaldehyde
- (ii) Benzoic acid and ethylbenzoate.

- b) Two moles of organic compound A on treatment with a strong base gives two compounds B and C. Compound B on dehydrogenation with Cu gives A while acidification of C yields a carboxylic acid D having molecular formula CH_2O_2 . Identify A,B,C and D and write the chemical reactions involved.

OR

- a) Write chemical equations to illustrate each of the following reactions

(i) Hell-Volhard –Zelinsky reaction

(ii) Rosenmund reduction

(iii)Aldol condensation

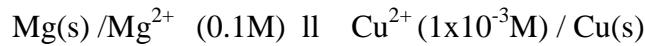
- b) What happens when

(i) Thionyl chloride reacts with benzoic acid.

(ii) Propanone is treated with zinc amalgam and HCl

25. a) Explain the electrochemical reactions occurring during rusting of iron. 5

- b) Calculate the emf of the following cell at 298 K.



Given $E^{\circ}_{\text{Cu}^{2+}/\text{Cu}} = +0.34 \text{ V}$, $E^{\circ}_{\text{Mg}^{2+}/\text{Mg}} = -2.37 \text{ V}$

OR

- a) State Kohlrausch's law of independent migration of ions.

- b) Write the overall cell reaction occurring during discharging of nickel cadmium cell.

- c) Conductivity of 0.00241 M acetic acid is $7.896 \times 10^{-5} \text{ Scm}^{-1}$. Calculate its molar conductivity. If λ_m^0 for acetic acid is $390.5 \text{ Scm}^2 \text{ mol}^{-1}$, what would be its dissociation constant?

26. a) Write two differences between order and molecularity of a reaction. 5

- b) Define Collision frequency.

- c) Calculate the rate constant of a reaction at 293 K,

Given that: $E_a=103 \text{ KJ/mol}$, $k=7.87 \times 10^{-7} \text{ s}^{-1}$ at 273 K, $R=8.314 \text{ J K}^{-1} \text{ Mol}^{-1}$

OR

- a) What is meant by pseudo first order reaction?

- b) Define rate constant.

- c) A first order reaction takes 40 minutes for 30% decomposition. Calculate $t_{1/2}$ of that reaction.

End of the Question Paper