Roll Number		

SET C

INDIAN SCHOOL MUSCAT
SECOND PRELIMINARY EXAMINATION
CHEMISTRY

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

04.02.2019 | 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.*
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g) *Use of log tables if necessary, use of calculators is not allowed.*

Section -A

1. Give a chemical tests to distinguish between Benzophenone and Acetophenone. 1

2. Write the type of magnetism observed when the magnetic moments are oppositively aligned and cancel out each other. 1

OR

Which stoichiometric defect does not change the density of the crystal?

3. Give one medicinal Application of coordination compounds 1

OR

Define ambidentate ligand with an example.

4. Draw the structure of Ethylphenylether. 1

5. Write the chemical formula of Dibromidobis(ethane1,2-diamine)cobalt(III) chloride 1

Section -B

6. Define 2

a) Anoxia b) Ebullioscopic constant

7. Explain the shapes of the following using VSEPR theory 2

a) $HClO_2$ b) XeF_2

8. Describe the preparation of potassium dichromate from iron chromite ore. 2

9. Give equations for the following reactions 2
   a) Williamsons synthesis
   b) Reimer-Tiemann reaction

10. a) What is Hardy Schulz rule? 2
    b) Why is ferric chloride preferred over potassium chloride in case of a cut leading to bleeding.

OR

Explain the following observations:
   a) Cottrell's smoke precipitator is fitted at the mouth of the chimney used in factories.
   b) Physical adsorption is multilayered, while chemisorption is mono layered.

11. a) What is meant by Shape Selective Catalysis? 2
    b) Explain Bredig's arc method.

OR

   a) Why is it necessary to remove CO when ammonia is obtained by Haber's process?
   b) How is adsorption of a gas related to its critical temperature?

12. Define the following terms : 2
    a) Fuel cell
    b) Limiting molar conductivity

Section –C

13. The density of KBr is 2.75 g/cm ^{3} .The length of edge of the unit cell is 654pm. Predict the type of the cubic lattice to which unit cell of KBr belongs? 3
(Atomic mass: K=39,Br=39)

14. Calculate the osmotic pressure of 0.1 M solution of NaCl which is ionized to 80% at 27 ^{0}C. 3
($R=0.0821\ LatmK^{-1}Mol^{-1}$)

15. a) What type of metal can be refined by liquation method. 3
    b) Name the method for refining of metals which are used as semiconductors.
    c) Why graphite rods gradually consume during Hall's Heroults process?

16. Explain giving reasons: 3
    a) $La(OH)_3$ is a stronger base than $Lu(OH)_3$
    b) The enthalpies of atomization of the transition metals are high.
    c) $Ce^{4+}$is a stronger oxidizing agent.

OR

Write chemical reaction for the following reactions:

a) oxidation of oxalate ion by MnO_4^- in acidic medium.

b) Disproportionation of manganese (VI) in acidic medium.

c) What is the effect of increasing pH on dichromate ion with the help of structures?

17. What happens (Give equations) 3

a) during acid catalysed dehydration of 1-Methylcyclohexanol.

b) When methyl magnesium bromide is treated with propanal followed by hydrolysis

c) When methoxy benzene is treated with HI.

18. a) What happens when diazonium salts are heated with ethanol? Give equation. 3

b) Which one is more basic CH_3NH_2 or $(CH_3)_3N$ in gaseous phase and why?

c) The best reagent for reduction of nitrobenzene to aniline is iron and HCl. Why?

19. a) Calculate ΔrG^o for the reaction $Mg\ (s) + Cu^{2+}\ (aq) \rightarrow Mg^{2+}\ (aq) + Cu\ (s)$ 3

Given : $E^o cell = +\ 2.71\ V$, $1\ F = 96500\ C\ mol^{-1}$

b) Calculate the potential of hydrogen electrode in contact with a solution whose pH is 10.

20. a) Name the two components of starch. How do they differ from each other structurally? 3

b) What is the effect of denaturation on the structure of proteins?

OR

a) What type of linkage is present in nucleic acids or two nucleotides?

b) Glycine does not show optical activity .why?

c) α-helix structure of protein is more stable than β-helix .why?

21. a) Give two examples of biodegradable polymers 3

b) Based on molecular forces what type of polymer is neoprene?

c) Write the monomer of the polymer which is represented as–[-CH_2-$CH(C_6H_5)$-]-n

22. Define the following in terms of their functions: 3

a) Enzymes

b) Anionic detergents

c) Food preservatives

OR

Mention one use of the following drugs

a) Bromopheniramine

b) Tincture of iodine

c) Streptomycin

23. Consider the complex $K_3\ [Cr(C_2O_4)_3]$. 3

a) Write the IUPAC name of the complex

b) Draw the isomers of the complex ion and mention the type of isomerism.

c) On the basis of Valence bond theory, predict its magnetic property

(Atomic number of Cr=24).

24. An optically active compound having molecular formula $C_7H_{15}Br$ reacts with aq. KOH to give a racemic mixture of products. Identify the isomer and write the mechanism involved for the reaction. 3

OR

Draw the structures of the major products in the following reactions

a) $CH_3CH{=}C(CH_3)_2 + HBr \rightarrow$

b) $CH_3CH_2CH_2OH + SOCl_2 \rightarrow$

c) 

Section -D

25. a) Explain 5

(i) Rate law (ii) Half life

b) The following results have been obtained during the kinetic studies of the reaction:

$2A + B \rightarrow C + D$

Experiment	[A]/mol L^{-1}	[B]/mol L^{-1}	Initial rate of formation of D/mol L^{-1} min^{-1}
I	0.1	0.1	6.0×10^{-3}
II	0.3	0.2	7.2×10^{-2}
III	0.3	0.4	2.88×10^{-1}
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Determine the rate law and the rate constant for the reaction

OR

a) Define collision frequency.

b) Write the rate law expression if the mechanism of the reaction

$2NO + 2H_2 \rightarrow N_2 + 2H_2O$ is

Step 1 $2NO + H_2 \rightarrow N_2 + H_2O_2$ (slow step)

Step 2 $H_2O_2 + H_2 \rightarrow 2H_2O$

c) The rate constant of a reaction are $1x10^{-3}$ sec $^{-1}$ and $2x\ 10^{-3}$ sec $^{-1}$ at 27^0 C and 37^0 C respectively. Calculate the activation energy of this reaction . .($R=8.314JK^{-1}mol^{-1}$)

26. a) Arrange the following in increasing order of acidic character 5

HOCl, HOI, HOBr

b) Give reason.

(i) ozone is thermodynamically unstable

(ii) H_2S is less acidic than H_2Te.

c) Complete &balance the following

(i) $PCl_3 + H_2O \rightarrow$

(ii) $P_4 + KOH + H_2O \rightarrow$

OR

An element 'A' exists as a yellow solid in standard state. It forms a volatile hydride 'B' which is a foul smelling gas and is extensively used in qualitative analysis of salts. When treated with oxygen, 'B' forms an oxide 'C' which is a colourless, pungent smelling gas. This gas when passed through acidified $KMnO_4$ solution, decolourises it. 'C' gets oxidized to another oxide 'D' in the presence of a heterogeneous catalyst. Identify A,B,C,D, and also give the chemical equation of reaction of 'C' with acidified $KMnO_4$ solution and for conversion of 'C' to 'D'.

27. a) Write the steps involved in the conversion of 5

(i) Aceto phenone to ethyl benzene

(ii) Benzoic acid to benzaldehyde

b) Give reasons

(i) Carboxylic acids are stronger acid then phenol

(ii) Acetaldehyde gives aldol condensation while formaldehyde does not.

(iii)Cyclohexanone forms cyanohydrins in good yields but 2,2,6- trimethyl cyclohexanone does not

OR

a) Describe the following reactions giving a chemical equation in each case:

(i) Cannizzaro reaction

(ii) Stephen reaction

b) Give names of the reagents to bring about the following transformations

(i) Allyl alcohol to propenal

(ii) But-2-ene to ethanol

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End of the Question Paper

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Section -A

1. Define ambidentate ligand with an example. 1

2. Give the IUPAC name and structure of the amine obtained when 3-chlorobutanamide undergoes Hoffmann –bromamide reaction 1

3. Give a chemical tests to distinguish between Benzophenone and Acetophenone 1

OR

Arrange the following compounds in increasing order of their reactivity towards nucleophilic addition reaction :

CH_3 –$COCH_3$, C_6H_5 –$COCH_3$, CH_3 –CHO

4. Write the chemical formula of Potassium hexacyanoferrate(ll) 1

5. Solids containing the F- centers are paramagnetic.why? 1

OR

Why glass panes fixed to windows of old buildings are invariably found to be thicker at the bottom than the top ?

Section -B

6. Explain the shapes of the following 2

   a) SF_4 b) $H_2S_2O_7$

7. Describe the preparation of potassium dichromate from iron chromite ore. 2

8. Give equations for the following reactions 2
   a) Williamsons synthesis
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9. Define 2
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   (R=0.0821 LatmK^{-1}Mol^{-1})

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