SHRI S.H.KELKAR COLLEGE OF ARTS, COMMERCE AND SCIENCE, DEVGAD. (SINDHUDURG)

S.Y.B.Sc. SEMESTER IV EXAMINATION MARCH 2023

COURSE: General Chemistry **COURSE CODE – USCH 401**

TIME : 8.30am 11:30am **MAX. MARKS: 100**

SET 2 **DURATION: 3 HOURS**

N.B. 1.All the questions are compulsory

2. Figures to the right indicates full marks

3. The use of log table/Programmable calculators are allowed.

Q. 1 A) Select the correct option and complete the following statement. **12**

i) Standard electrode potential of H_2 electrode is....V

a) 1 b) 2 c) 0

ii) According to standard convention electrode which is written on RIGHT hand side is .....

a) cathode b) anode c) plastic electrode

iii) The Condensed Gibbs phase rule is given by the relation

a) F=P-C+2 b) F=C-P+1 c) F=C+P-2

iv) The degree of freedom of system Ice = Water = Vapour

a) 0 b) 1 c) 2

v) In first transition series ..... Element has its 3d shell exactly half filled.

a) Sc. b) Cr. C) Co

vi) In Ni(CO)4 each carbonyl ligand donayes ..... electron pain in Nickel.

a) One b) four c) Two.

vii) Highest oxidation state of manganese is

a) +3. b) +5. c) . +7.

viii) The..... lie between s and p block element in periodic table.

a) Inner transition elements b) Transition elements c) Both i and ii.

ix) P-Toluic acid is .....than benzoic acid.

a) Stronger b) Weaker c) None of these

x) The reaction of carboxylic acid with an alcohol to form an ester is called .....

a) Hydrolysis b) Esterification c) Oxidation

xi) Detergents are salts of .....

a) Carboxylic acid b) Sulfonic acid c) Acetic acid

xii) The reaction involving introduction of sulfonic acid group in the aromatic ring is known as .....

a) Sulfonation b) Alkyl sulfonation c) Aryl sulfonation

B) State whether the following statements are TRUE or FALSE. **03**

i) Double vertical line represents salt bridge in cell.

ii) 3d series contain ten elements.

iii) Sulfonation of benzene is electrophilic substitution reaction.

C)Match the following (attempt any FIVE) **05**

Sr No.	Column A	Column B
i)	Triple point	Cathode
ii)	Diamagnetism	All phases co-exist
iii)	Paramagnetism	paired electron
iv)	SO_3	unpaired electron
v)	$LiAlH_4$	Reduction
		Sulfonation

Q. 2) Attempt any FOUR of the following.

A. Find the emf of the following cell at 298 K 5

$Ag \mid AgCl_{(s)}, Cl^- (a= 0.2) \parallel Ag^+ (a=0.04) \mid Ag$

B. Give the conventions used to represent the Galvanic cell. 5

C. Differentiate between galvanic cells and voltaic cells. 5

D. Give the classification of electrodes. 5

E. State and explain Gibbs phase rule.

F. What is Clapeyron Clausis equation. 5

Q. 3) Attempt any FOUR of the following.

A. Give the formula of following. 5

i. Tris(ethylene diammine) Nickel(II) Chloride

ii. Penta aqua chloro Cobalt(III) Sulphate.

iii. Hexa carbonyl Chromium(0)

iv.Diammine Silver (I) Chloride

v. Hexamine Cobalt (III) Chloride

B. What are the postulates of valence bond theory 5

C. What are the postulates of Werners Coordination theory. 5

D. write a short note on

(i) 18 electron rule. 5

(ii) Inner orbital and outer orbital.

E. .Explain i. Diamagnetism ii. Paramagnetism. 5

F. Name the important oxide of Titanium and Vanadium. Give properties of any two oxide of Vanadium. 5

Q. 4) Attempt any FOUR of the following.

A. Give the preparation of following, 5

a) Phthalic acid b) Benzoic acid c) Ethyl acetate d) Benzoyl chloride

B. How will you convert Benzoic acid to, 5

a) Benzene b) Sodium Benzoate c) Methyl benzoate d) Benzyl alcohol

C. Discuss the mechanism of Dieckmann condensation. 5

D. Explain the following : 5

i) P-Nitrobenzoic acid is stronger acid than Benzoic acid.

ii)Formic acid is stronger acid than acetic acid.

E. What is sulfonation ? Discuss the mechanism of sulfonation of Benzene. 5

F. Give the reactions for sulfonation of , a) phenol b) Toluene c) Nitrobenzene d) Benzene sulfonic acid . 5

Q. 5) Attempt any FOUR of the following.

A. Give the various applications of electrochemical series. 5

B. Give the application of phase rule to Water system. 5

C. Represent the electronic configurationof 3d transition elements and mention the elements with special stability. 5

D. Write a note on application of coordination compound. 5

E. Explain the following reactions giving an example, 5

i)Acyl nucleophilic substitution ii) HVZ reaction

F. Give the Preparation of following : 5

i) O- & P- Toluene Sulfonic acid ii) Naphthalene-1-sulfonic acid & Naphthalene-2-Sulfonic acid

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