R-19

Code:3303/BL

Faculty of Science

B.Sc (Chemistry) II-Year, CBCS –III Semester

Backlog Examinations –June/July, 2022

PAPER: Chemistry-III

Time: 3 Hours Max Marks: 80

Section-A

I. Answer any *eight* of the following (8x4=32 Marks)

1. How do you separate lanthanides using ion exchange method?
2. What are the postulates of Werner's theory? Give its limitations.
3. Define organo metallic compounds? Give their classification and applications.
4. Give the preparation of Propanoic acid using Arndt-Eistert synthesis.
5. Write a) Nef reaction b) Reduction of nitro benzene
6. Give preparation and any two chemical properties of isocyanides.
7. Define first law of thermodynamics. Give its limitations.
8. Define Joule-Thompson coefficient? Give its significance.
9. What is entropy? How do you relate it to spontaneity of a process?
10. Explain Haloform reaction.
11. Give the conversion of smaller alkynes to higher alkynes with suitable example.
12. Define Phase rule and explain terms in it.

Section-B

II. Answer the following (4x12=48 Marks)

13. (a) Discuss the preparation, properties and structural features of $Ni(CO)_4$.

(OR)

(b) Explain the stereoisomerism in complexes with co-ordination number 4 with suitable examples.

14. (a) Give the one method of preparation and two chemical properties of Carboxylic acid derivatives (esters, amides, acid halides and anhydrides).

(OR)

(b) What is the mechanism for the preparation of amines using Hoffman's Bromamide reaction? Explain the Hinsberg separation of amines briefly.

15. (a) What are isothermal and adiabatic processes? Derive the expression for maximum work done in an isothermal reversible process?

(OR)

(b) Derive the relation between ΔG, ΔH and ΔS. Give the significance of equation. For a given chemical reaction, if ΔH=-38.3 KJ and ΔS=-130 JK^{-1}, what is the temperature condition for spontaneity of the reaction?

16.(a) Define error? How do you express error? Give the classification of errors with suitable examples.

(OR)

(b) What is desilverisation of lead? Explain using Phase diagram of Pb-Ag system.

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R-19

Code:3303/R

Faculty of Science

B.Sc (Chemistry) II-Year, CBCS –III Semester Regular Examinations –Jan, 2023

PAPER: Chemistry - III

Time: 3 Hours Max Marks: 80

Section-A

I. Answer any *eight* of the following questions (8x4=32 Marks)

1. Write the separation of lanthanides by solvent extraction method
2. Discuss the hybridization of $[NiCl_y]^{-2}$ on basis of VBT
3. Write about the classification of organometallic compounds
4. Write the following reactions
   (a) HVZ reaction (b) Huns Dicker reaction
5. Write the following reactions
   (a) Nef reaction (b) Nitrobenzene prevented by nitration
6. Write the following reactions
   (a) Carbylamines reaction (b) Diazotization
7. Derive C_p-C_v=R
8. Discuss Joule Thomson coefficient
9. Define first law and second law of thermodynamics
10. What are determinate and indeterminate errors?
11. Write about the tautomer's in carbonyl compounds
12. Define phase and component with examples

Section-B

II. Answer the following questions (4x12=48 Marks)

13.(a) What is lanthanide contraction? Write about its cause and consequences.

(OR)

(b) Explain the isomerism in coordination compounds.

14.(a) Explain the following reaction with reaction mechanism
(i) Hoffmann Bromamide reaction (ii) Esterification

(OR)

(b) Write a note on the following reactions
(i) Hinsberg separation (ii) Arndt-Eistert Synthesis (iii) Schmidt reaction

15.(a) Derive the expression for maximum work for isothermal reversible process.

(OR)

(b) Explain Carnot's cycle

16.(a) Explain the phase diagram of Ag-Pb system

(OR)

(b) Write about the following
(i) Significant figures (ii) Accuracy (iii) Precision

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R-19

Code:3303/19/BL

Faculty of Science

B.Sc(Chemistry) II-Year, CBCS–III Semester Backlog Examinations –June, 2023

PAPER: Chemistry - III

Time: 3 Hours Max Marks: 80

Section-A

I. Answer any *eight* of the following questions (8x4=32 Marks)

1. What is Lanthanide contraction? Write its Consequences
2. Draw the structures of $Fe(CO)_5$ and $Fe_2(CO)_9$
3. Write about the Optical isomerism in Tetrahedral Complexes [MABCD].
4. Write about the following: (i) Huns-Dicker reaction (ii) HVZ reaction.
5. Write about the following: (i) Nef reaction (ii) Gabriel Synthesis
6. Write about the following:
   (i) Carbylamines reaction (ii) Sand Meyer and Gatterman
7. Write a note on Jovle – Thomson Coefficient.
8. Write about Kirchhoff's equation
9. Write a note on Maxwell relations
10. Define the terms Phase, Component and Degrees of Freedom.
11. Define Accuracy and Precision
12. Write about the tautomerism in ethylacetoacelate

Section-B

II. Answer the following questions (4x12=48 Marks)

13.(a) Explain the preparation properties and structure of Nickel Tetra carbonyl $[Ni(Co)_4]$

(OR)

(b) Explain the structure and hybridization of following complexes.
(i) $[Fe(CN)_6]^{-4}$ (ii) $[Co(NH_3)_6]^{+3}$

14.(a) Write the reaction and reaction mechanism of following.
(i) Esterification (ii) Hoffman's Bromamide reaction

(OR)

(b) Explain the reaction of 1^0, 2^0, 3^0 aliphatic and aromatic amines with Nitrous acid.

15.(a) Derive equation $\Delta G=\Delta H-T\Delta S$

(OR)

(b) Explain carnot's cycle

16.(a) Explain the phase diagram of silver-lead system

(OR)

(b) What are Errors? Explain the classification of errors.

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