DZ-003-2014004 Seat No. _____

B. Sc. (Sem. IV) (CBCS) (W.E.F.-2019) Examination

April – 2022

Chemistry Theory : Paper-C-401

(New Course)

Faculty Code : 003
Subject Code : 2014004

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions :

(1) The question paper is consist of ten main questions. Each question carry 14 marks.
(2) You can answer any five main question.
(3) Figure at the right side of sub-question shows the individual marks.

1 (a) Answer the following questions : **4**
(1) Define : Organometallic compounds.
(2) Give the example of covalent bond containing organometallic compound.
(3) Ferrocene is diamagnetic. – True or false ?
(4) What is Hapticity ?

(b) Classify : Organometallic compounds. **2**

(c) Write a short-note on 'Zeise Salts. **3**

(d) Describe in detail : Ferrocene. **5**

2 (a) Answer the following questions : **4**
(1) What are microelements ? Give examples.
(2) How many Nitrogen atoms are found in porphyrin ?
(3) Give the types of chlorophyll.
(4) Which element is responsible for Itai-Itai diesease ?

(b) Write on Toxicity of Arsenic. **2**

(c) Give the importance of chlorophyll. **3**

(d) Discuss the structure of Haemoglobin and its role in biological system. **5**

3 (a) Answer the following questions : 4

(1) Define : "Clathrates of noble gases".

(2) What the word "Noble" indicates for elements ?

(3) Write the chemical structure of "ethylcynoacetate".

(4) Give IUPAC name of $CH_3COCH_2COCH_3$.

(b) Explain the structure of $XeFz$. 2

(c) Write the synthesis of $XeOF_4, XeO_2F_2$ & $XeOF_2$. 3

(d) Describe the uses of "Noble Gases". 5

4 (a) Answer the following questions : 4

(1) Give the main occutance of Noble gases.

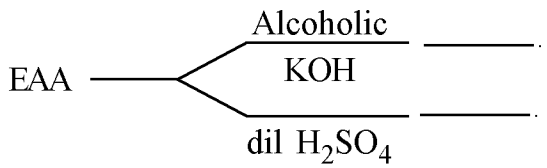
(2) Give the names of scientists who worked for noble gases.

(3) Write the structure of ethylacetoacetate.

(4) Complete the reaction :

$EAA + C_2H_5ONa + RX \rightarrow$ _____.

(b) Complete the reaction : 2



(c) Give the method of preparation for crotonic acid from EAA. 3

(d) Give the method of preparation for Levulinic acid and Adipic Acid from EAA. 5

5 (a) Answer the following questions : 4

(1) Write the structure of chloroacetic acid.

(2) Give IUPAC name of $CH_3COOC_2H_5$.

(3) Aldehydes and ketones are known as _____ compounds.

(i) JampuMor Compounds

(ii) S'Kjosh compounds

(iii) Vir Snake-catcher compounds

(iv) Carbonyl compounds

(4) Give the structure of 3-Hydroxybutanal.

(b) Give conversion of benzene from sodium benzoate. 2

(c) Discuss Rosenmund's reaction. 3

(d) Discuss the relative reactivity of Aldehydes and Ketones. 5

6 (a) Answer the following questions : 4

(1) $CH_3COOH + SOCl_2 \rightarrow$ _____. Complete the reaction.

(2) Reaction of benzene with acetic anhydride gives _____.

(3) Give the structure of propanone.

(4) General formula of aldehydes & ketones is _____.

(b) Write the reaction of carbonyl compounds with HCN and Grignord reagent. 2

(c) Write the reactions of acetic acid with $SOCl_2$, PCl_5, PCl_3. 3

(d) Discuss the preparation of carboxylic acid derivatives. 5

7 (a) Answer the following questions : 4

(1) Name any one catalyst, used in Perkin reaction.

(2) Give examples of colligative properties.

(3) Define : Additive properties.

(4) The drop of liquid is spherical in shape is due to _____.

(b) Discuss the effect of temperature on surface tension. 2

(c) State the application of dipole moment. 3

(d) Discuss with mechanism : Aldol condensation. 5

8 (a) Answer the following questions : 4

(1) Write the structure of benzyl.

(2) In wittig reaction, _____ compound is reacted with carbonyl compounds.

(3) Unit of dipolement is _____.

(4) Stalagmometer is used to determine _____.

(b) What is "Ordinary light" and "Planed Polarizal light". 2

(c) Write the names of methods to determine the dipolemoment. 5

(d) Discuss : 'Ostwald Viscometer'. 5

9 (a) Answer the following question : **4**

(1) Define : System.

(2) The thermos is example of which type of system ?

(3) Define : Thermodinamics.

(4) What is state function ?

(b) Define – "Homogeneous and Heterogeneous system". **2**

(c) Derive the equation for ideal gas, $C_P - C_V = R$. **3**

(d) State "Kirchoff's law" and derive. **5**

10 (a) Answer the following questions : **4**

(1) State : First law of thermodinamics.

(2) What is "Heat Capacity" ?

(3) What is Reversible process ?

(4) Define : Cyclic process.

(b) Provide the examples of extensive and intensive properties. **2**

(c) Differentiate – Reversible and Irreversible process. **3**

(d) Give details about "Joule-Thomson effect". Derive Joul-Thomson co-efficient for an ideal gas. **5**
