RAJ-003-1014004 Seat No. _____

B. Sc. (Sem. IV) (CBCS) Examination

March / April - 2019

Chemistry : C-401

(New Course)

Faculty Code : 003
Subject Code : 1014004

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

Instructions : (1) This question paper contains five questions and all are compulsory.
(2) All questions carry 14 marks each and figures to the right indicate full marks.
(3) Write sub questions (a), (b), (c) and (d) of particular question together.

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

(1) Write the structural formula of Trimethyl aluminium (dimer).

(2) Give one example for covalent (σ bonded) orgnometallic compound.

(3) Which metal is associated in the structure of chlorophyll ?

(4) Which heterocyclic ring is present in porphyrins ?

(b) Answer any one : **2**

(1) Write any one chemical property (reaction) of organolithium compound.

(2) How many –COOH groups and how many–$CH{=}CH_2$ groups are present in the structure of Haemoglobin ?

(c) Answer any one : **3**

(1) What is Zeise salt ? Explain with example.

(2) Describe in brief : Importance of Chlorophyll.

(d) Answer any one : **5**

(1) Discuss the structure of Ferrocene in detail.

(2) Explain the structure and role of Haemoglobin in biological system.

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

(1) How many unpaired electrons are present in outer orbital of Noble gas.

(2) Write symbol, atomic no. and electron configuration of Krypton.

(3) Give preparation of Ethylacetoacetate from Acetoacetic acid.

(4) Give reaction of Ethylacetoacetate with HCN.

(b) Answer any one : **2**

(1) Write any six uses of Noble gases.

(2) Explain Keto-Enol tautomerism with example.

(c) Answer any one : **3**

(1) Explain hybridization and structure of XeF_4.

(2) Give preparation of Acetonylacetone from ethylacetoacetate.

(d) Answer any one : **5**

(1) Explain hybridization, structure and chemical properties of XeO_2F_2 in detail.

(2) Explain Claisen condensation reaction with mechanism for Ethylacetoacetate.

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

(1) What is Cyanohydrin ? Give any one example.

(2) Write the structure of Phenyl hydrazine.

(3) Write structure of Acetic anhydride.

(4) Write structure of Ethyl propanoate.

(b) Answer any one : **2**

(1) Complete the reaction :

$$CH_3 - CO - CH_3 + H_2N - NH_2 \rightarrow$$

(2) Give one preparation of mono carboxylic acid.

(c) Answer any one : **3**

(1) Write only reaction of Acetone with Semicarbazide and Clemenson reduction of Acetone.

(2) Explain HVZ reaction.

(d) Answer any one : **5**

(1) What is Acetal and Ketal ? Explain in detail with example.

(2) What is Trans esterification ? Explain in detail with mechanism.

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

(1) Write structural formula of Witting reagent.

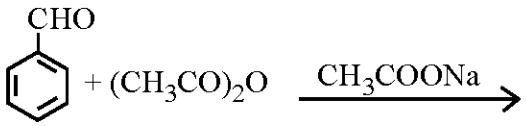
(2) Write structural formula of Phenylisocyanate.

(3) Give the name of apparatus which is used to measure surface tension.

(4) What is the CGS unit for dipole moment ?

(b) Answer any one : **2**

(1) Complete the reaction :



(2) Define Parachor and write equation showing relation between Parachor and molar volume of liquid.

(c) Answer any one : **3**

(1) Explain Aldol condensation with mechanism.

(2) What is Refractive index ? Explain Molar refractivity of solutions and solids.

(d) Answer any one : **5**

(1) Explain Backmann rearrangement with mechanism.

(2) Define Viscosity. Explain Ostwald's viscometer and measurement of viscosity.

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

(1) Name the system in which exchange of matter or energy with surroundings is not possible.

(2) Name the process in which pressure remains constant.

(3) Define specific heat with equation.

(4) Explain Intensive properties.

(b) Answer any one : **2**

(1) Explain Zeroth law of Thermodynamics.

(2) Write statements for the First Law of Thermodynamics.

(c) Answer any one : **3**

(1) Define enthalpy and derive equation for relation between ΔH and ΔE.

(2) Derive relationship between pressure and volume for adiabatic process of ideal gas.

(d) Answer any one : **5**

(1) Prove that $W_{rev} > W_{irr}$.

(2) Derive $C_p - C_v = R$