SEAT No. _____

No. of printed pages : 02

[56] Eng.

SARDAR PATEL UNIVERSITY

B. Sc. Vth - SEMESTER EXAMINATION

Thursday, 24th December, 2020

2.00 p.m. to 4.00 p.m.

US05CCHE21 - ORGANIC CHEMISTRY

Total Marks : 70

Note: (i) All questions are to be attempted. (ii) Figures to the right indicate marks.

Q.1 Choose the correct option for the following : **[10]**

(i) ..... is not aromatic in nature ?
(a) pyrrole (b) furan (c) piperidine (d) thiophene

(ii) Isoniazid is used in the treatment of ..... ?
(a) malaria (b) gaute (c) cancer (d) tuberculosis.

(iii) Quinoline can be prepared using .....?
(a) Chichibabin reaction (b) Skraup synthesis
(c) Knorr synthesis (d) Hauben-Hoesch reaction

(iv) Using which reaction Cinnamic acid can be prepared ?
(a) Perkin Condensation (b) Aldol
(c) Reimer-tiemann (d) Sommelet

(v) In a Benzilic acid rearrangement in the presence of strong base 1,2-diketones is converted into .....
(a) α-Hydroxy ester (b) α-Hydroxy acid
(c) α-Hydroxy ketone (d) α-Hydroxy amine

(vi) Conversion of ketoxime to nitrogen substituted amide in the presence of acid catalyst is known as .....
(a) Baeyer – Villiger Oxidation (b) Favorskii rearrangement
(c) Sommelet rearrangement (d) Beckmann rearrangement

(vii) Nylon-6,6 is prepared from .....
(a) succinic acid and hexamethylene diamine
(b) adipic acid and hexamethylene diamine
(c) oxalic acid and hexamethylene diamine
(d) terephthalic acid and hexamethylene diamine

(viii) Which one of the following has very high tensile strength?
(a) fibers (b) elastomers
(c) plastics (d) none of these

(ix) *terpenoids* upon treatment with phenylhydrazine yields phenylhydrazone derivative indicates that, it contains ..... group.
(a) carbonyl (b) phenolic -OH (c) alcoholic -OH (d) - COOH

(x) Camphor upon oxidation with conc. HNO_3 gives .....
(a) cinnamic acid (b) camphoric acid
(c) oxalic acid (d) none of these

Q.2 State whether the following statements are true or false: **[08]**

(i) Picoline upon oxidation gives pyridine carboxylic acid.

(ii) In a heterocyclic compounds, numbering starts from carbon atom.

(iii) Benzoin condensation reaction proceeds using alcoholic KCN.

(iv) Aldehyde in presence of H_2SO_4/HN_3 gives nitrile and N-formyl derivatives.

(v) Thermoplastics is a cross-linked polymer and it harden on heating.
(vi) Natural rubber have trans configuration at every double bond.
(vii) Camphor can be prepared from camphene.
(viii) β – carotene contains eleven double bonds.

Q.3 Answer the following (Attempt any ten) : **[20]**

(i) Explain piperidine is stronger base than pyridine.
(ii) How will you convert β-picoline into 3-aminopyridine ?
(iii) Write about Chichibabin reaction.
(iv) Show that Birch reduction of toluene gives 2,5-dihydrotoluene.
(v) Explain Hoffmann rearrangement.
(vi) How benzoic acid in presence of liquid ammonia / sodium metal and ethanol is converted in to 1,4-dihydrobenzoic acid ?
(vii) Give the synthesis of vulcanized rubber.
(viii) Discuss resonance in conjugated diene.
(ix) What are the difference between addition polymerization and condensation polymerization?
(x) Give oxidation product of : (a) citral and (b) α–pinene.
(xi) Give the name of methods used for the isolation and separation of terpenoids from plant materials.
(xii) Predict the number of ring(s) present in the terpenoid having molecular formula $C_{10}H_{16}$, and containing one double bond.

Q.4 Answer the following (Attempt any four) : **[32]**

(i) Explain nucleophilic substitution reaction in pyridine is preferred at the 2^{nd} and 4^{th} position. Also give synthesis of 1-azaphenanthrene using Skraup synthesis.
(ii) Explain pyrrole is extremely weak base. Also write synthesis of 1-methyl isoquinonlene using Bischler-Napieralski synthesis.
(iii) Give reaction mechanism for the preparation of Mannich base. Also explain that in Mannich reaction out of two --CH_2 -- group of Mannich base one is from formaldehyde substrate.
(iv) Write reaction mechanism for Benzilic acid rearrangement and Favorskii rearrangement.
(v) Give classification of polymers. Discuss step reaction polymerization giving synthesis of Dacron.
(vi) Discuss coordination polymerization and its advantage over free radical polymerization for the preparation of polyethylene. Also discuss the tacticity in polypropylene.
(vii) Write synthesis of Camphor. Give evidence for the presence of two β – ionone units in β – carotene.
(viii) Write synthesis of Citral. Also discuss Wallach's oxidative degradation for the determination of position of double bond and *tert.* alcoholic group in the structure of α-terpeniol.

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