

SEAT No. _____

$\left[\frac{41/A-12}{Eng} \right]$

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SARDAR PATEL UNIVERSITY

B. Sc. VIth - SEMESTER EXAMINATION,

Thursday, 15th July - 2021

10.00 a.m. to 12.00 p.m.

US06CCHE21 - 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) Zwitter ion exist as a cation in solution.
(a) acidic (b) basic (c) neutral (d) all of these
- (ii) Glycine can be prepared from using direct ammonolysis.
(a) aspartic acid (b) oxalic acid (c) cinnamic acid (d) acetic acid
- (iii) In Flat sheet structure of protein, the repeat distance between two alternate amino acid residue is
(a) 3.5 \AA^0 (b) 7.0 \AA^0 (c) 7.2 \AA^0 (d) 7.04 \AA^0
- (iv) Which group is determined by Zeisel method ?
(a) $-\text{OH}$ (b) $-\text{COOH}$ (c) $-\text{OCH}_3$ (d) $-\text{C}=\text{O}$
- (v) Which alkaloid was first synthesized ?
(a) Atropine (b) Nicotine (c) coniine (d) papaverine
- (vi) Which alkaloids contain ester linkage ?
(a) Atropine (b) Nicotine (c) coniine (d) papaverine
- (vii) is an explosive.
(a) Cyclonite (b) Malachite green (c) Alizarin (d) Aldrin
- (viii) Alizarin is a dyes.
(a) Mordant (b) Vat (c) Dispersed (d) anthraquinone
- (ix) Direct irradiation of solution of either cis - or trans - stilbene yields a mixture consisting of
(a) 50% cis - stilbene and 50% trans- stilbene
(b) 40% cis - stilbene and 60% trans- stilbene
(c) 60% cis - stilbene and 40% trans- stilbene
(d) 20% cis - stilbene and 80% trans- stilbene
- (x) In an organic molecule, even number of electrons are present and these electrons are in the ground state.
(a) paired (b) unpaired (c) both 'a' & 'b' (d) none of these

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

- (i) Silk fibroin have secondary structure.
- (ii) 2,4-dinitroflorobenzene is used as a reagent in Pehr-Edman method.
- (iii) Side chain of coniine contains n-propyl group.
- (iv) Nicotine is an important alkaloid of pyrrolidine-pyridine group.

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- (v) A dye is a colored organic mixture that may be used for imparting colour to a substrate.
- (vi) PETN is one of the most powerful and sensitive high explosives.
- (vii) Sometimes activation energy requirements are so high that molecules undergo spontaneous transformations even at room temperature.
- (viii) The relation between energy of radiation to frequency and wavelength can be expressed by $E = h \nu$.

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

- (i) Write synthesis of aspartic acid.
- (ii) Explain the geometry of peptide linkage.
- (iii) What is Isoelectric point of amino acids? Give characteristics of amino acids at its Isoelectric point.
- (iv) Show that coniine is a pyridine derivative.
- (v) Show that Papaverine contains four methoxy groups.
- (vi) How to determine oxo ($C=O$) and methoxy ($-OCH_3$) group present in the structure of alkaloids?
- (vii) Give the name and structure of substance which is an intermediate between the detonators and the high explosives and is used as a booster explosive.
- (viii) Write the structure and uses of Malachite Green.
- (ix) Define the term pesticides? What are the uses of methoxychlor?
- (x) Write limitation of Paterno-Buchi reaction.
- (xi) Explain: Michler's ketone do not undergo photo reduction in isopropyl alcohol, while benzophenone does.
- (xii) Define: Fluorescence and Phosphorescence.

Q.4 Answer the following (Attempt any four):

- (i) Write synthesis of Gly-Phe-Ala using benzyl chloroformate. Also give [8]
difference between α -helix and pleated sheet structures of proteins.
- (ii) Discuss Pehr-Edman method used for *N*-terminal residue analysis of proteins [8]
with its advantages and limitations. Also write synthesis of (a) Purine using Uric acid and (b) Pyrimidines using Gabriels method.
- (iii) Write the synthesis of Coniine. Discuss the point of attachment of *N*- [8]
methylpyrrolidine to the pyridine nucleus in the structure of Nicotine.
- (iv) Write the synthesis of: (a) Nicotine via Spath and Bretschneider and [8]
(b) Papaverine via Bido and Wilkinson synthesis.
- (v) Give broad classification of Dyes according to their application on fibers. Also [8]
write the synthesis and uses of Congo red.
- (vi) Write the synthesis and uses of: (a) RDX (b) Malathion (c) Indigo. [8]
- (vii) Write reaction of butadiene (a) upon direct irradiation at 250 nm and (b) upon [8]
irradiation at 366 nm in the presence of benzophenone. Also write about Norrish type-II reaction.
- (viii) Explain: (a) Photo-Fries rearrangement and (b) Barton reaction. [8]

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