

Vithalbhai Patel & Rajratna P. T. Patel Science College
Vallabh Vidyanagar

B. Sc. (Sixth Semester) (CHEMISTRY)

Subject : ORGANIC CHEMISTRY (US06CCHE01)

Date : 05-03-2019

Internal Examination - 2019

Marks : 50

Day : Tuesday

Time : 10.00 to 12.00 noon

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

Q.1 Choose the correct option for the following :

[8]

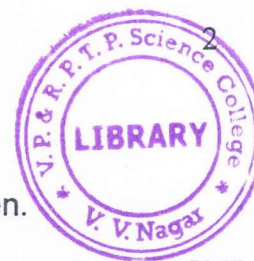
- (i) (-) - Arabinose is converted into D - (+) - glucose by
- (a) Killiani-Fisher synthesis (b) Ruff degradation
(c) Haworth synthesis (d) none of these
- (ii) Which one is an invert sugar ?
- (a) (+) - Glucose (b) (+) - Maltose (c) (+) - Mannose (d) (+) - Sucrose
- (iii) Anthracene upon treatment with $K_2Cr_2O_7 / H_2O$ gives
- (a) Benzoic acid (b) Phthalic acid (c) Anthraquinone (d) Benzophenone
- (iv) Molecular formula of naphthalene is
- (a) C_8H_{10} (b) $C_{10}H_8$ (c) $C_{10}H_{10}$ (d) $C_{10}H_{12}$
- (v) Which of the following molecule is aromatic in nature ?
- (a) cyclopentadienyl anion (b) cyclopentadienyl cation
(c) cyclopentadienyl radical (d) none of these
- (vi) In Diels-Alder reaction, the diene must be in configuration.
- (a) E (b) s-trans (c) s-cis (d) Z
- (vii) Which group is an auxochrome ?
- (a) -N=N- (azo) (b) -NH₂ (c) -NO₂ (d) all of these
- (viii) Which one is used as food dye ?
- (a) picric acid (b) alizarin (c) methylene blue (d) Orange-I

Q.2 Answer the following (Attempt any five) :

[10]

- (i) Explain : Phenylhydrazine could be used as a powerful tool in the study of carbohydrates.
- (ii) Explain that (+)-glucose is a pyranose and not a furanose.
- (iii) Explain : C_1-C_2 bond is shorter than C_2-C_3 bond in naphthalene.
- (iv) Write a note on Bucherer reaction.
- (v) Write Woodward-Hoffmann rules for electrocyclic reaction.
- (vi) Draw molecular orbital diagram of 1,3-butadiene.





(vii) Define Dyes. What are the requisites for a true dye?

(viii) Explain : Crystal violet is lighter in color than malachite green.

Q.3

[08]

[A] Prove that (+) - glucose is an aldohexose sugar.

[B] Show that (+)-maltose is a 4-O-(α -D-glucopyranosyl)-D- glucopyranose.

OR

Q.3

[08]

[A] Discuss the host-guest relationship properties of cyclodextrin. What are the effect of cyclodextrin on chemical reaction ?

[B] Discuss Ruff degradation with suitable illustration.

Q.4

[08]

[A] Write the structure and name of potent carcinogens. Discuss the mechanism of mode of action of carcinogens in human cell.

[B] Explain: 1-nitronaphthalene upon further nitration gives 1, 8-dinitro naphthalene as a major product.

OR

Q.4

[08]

[A] Give the synthesis of 1, 4, 9 - trimethyl phenanthrene from 1-methyl naphthalene and succinic anhydride using Haworth synthesis.

[B] Discuss Sulfonation of naphthalene.

Q.5

[08]

[A] Explain the suprafacial and antarafacial modes of cycloaddition reaction. Also give Woodward-Hoffmann rules for the same.

[B] Complete and rewrite the following reaction :

(i) cis, trans-2,4-hexadiene $\xrightarrow{\text{thermal}}$

(ii) trans, trans-2,4-hexadiene + ethylene $\xrightarrow{\text{thermal}}$

OR

Q.5

[08]

[A] Explain : [4+2] thermal cyclization takes place readily but [2+2] thermal cyclization does not.

[B] Write a note on Cope rearrangement and Sigmatropic reaction.

Q.6 Write synthesis and application of following :

(i) Crystal violet (ii) Disperse Blue-1 (iii) Mercurochrome.

[08]

OR

Q.6

[08]

[A] Give the difference between dyes and pigments. What are the requirements of an organic pigments ?

[B] Give synthesis of : (i) Dye used as thermally stable pigment and (ii) Dye used in carbonet beverages.