

Total No. of Questions—8]

[Total No. of Printed Pages—3

Seat No.	
---------------------	--

[5559]-211

S.E. (Chemical) (First Semester) EXAMINATION, 2019

CHEMISTRY-I

(2015 PATTERN)

Time : 2 Hours

Maximum Marks : 50

1. (a) Derive an integrated rate equation for first order reaction and explain the characteristics. [6]
- (b) Give the molecular orbital distribution and deduce the bond order for CO molecule. [6]

Or

2. (a) Draw the resonating structure of : [6]
- (i) Naphthalene
- (ii) Phenoxide ion
- (iii) Chlorobenzene.
- (b) Define and explain the following terms : [6]
- (i) Velocity constant
- (ii) Order and molecularity of reaction
- (iii) Pseudomolecular reaction.

P.T.O.

3. (a) Derive the thermodynamic equation for depression in freezing point of solution. [6]
- (b) Explain the principle and application of TLC. [4]
- (c) Explain the applications of IR spectroscopy. [3]

Or

4. (a) Explain any *two* detectors used in gas chromatography. [6]
- (b) A solution of 3.0×10^{-4} kg of camphor [$C_{10}H_{16}O$] in 25.3×10^{-3} kg of chloroform boils at 334.3 K. Boiling point of chloroform is 334 K. Calculate $\Delta \bar{H}_{\text{vap}}$ and K_b for chloroform. [4]
- (c) Explain Berkley and Hartley method. [3]
5. (a) Discuss the mechanism of ϵ_1 and ϵ_2 reaction of alkyl halides. [6]
- (b) What are the effects of the following factors on S_N1 and S_N2 reaction ? [6]
- (i) Nature of nucleophile
- (ii) Nature of substrate
- (iii) Nature of leaving group.

Or

6. (a) Give mechanism of Friedel-Craft alkylation and give its merits. [6]
- (b) Write short notes on : [6]
- (i) Claisen Rearrangement
- (ii) Beckman rearrangement.

7. (a) Give classification of dyes on the basis of application. [7]
(b) Explain any *three* methods for synthesis of Furan. [6]

Or

8. (a) Give synthesis of the following dyes : [7]
(i) Crystal violet.
(ii) Methyl orange.
(b) Write a short note on diazotisation and coupling in azo dyes. [6]