

B.E/B.TECH. Degree Examination, December 2020

Third Semester

CH18305 – APPLIED CHEMISTRY

(Regulation 2018)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions**PART A - (8 X 2 = 16 marks)**

1. According to adsorption theory of catalysis, the speed of the reaction increases because
 - a. adsorption produces heat which increases the speed of the reaction
 - b. in the process of adsorption, the activation energy of the molecules becomes large
 - c. the concentration of the reactant molecules at the active centres of the catalyst becomes high due to adsorption
 - d. adsorption lowers the activation energy of the reaction
2. At a constant temperature, the solubility of a gas in a liquid is proportional to the pressure of the gas above it. This law is
 - a. Le Chatelier's Principle
 - b. Henry's Law
 - c. Raoult's Law
 - d. Nernst Distribution Law
3. Select the following groups that has the lowest priority according to the Cahn-Ingold-Prelog sequence rules?
 - a. $C \equiv CH$
 - b. $CH = CH_2$
 - c. $CH(OH)CH_3$
 - d. CH_3CH_2OH
4. Which of the following can make difference in optical isomers?
 - a. temperature
 - b. heat
 - c. polarized light
 - d. pressure
5. Discriminate between positive and negative adsorption.
6. List out the advantages of Multiple Extraction.
7. Fumaric acid does not yield anhydride. Give the reason
8. State that the hydroboration reaction is stereospecific with an example.

PART B - (4 X16 = 64 marks)

09. (a) (i) Deliberate the role of adsorption in pollution abatement. (8)
(ii) Derive the Langmuir adsorption isotherm and explain the variation θ with low, medium and high pressure. (8)

(OR)

- (b) (i) Differentiate homogeneous and heterogeneous catalysis. (8)
(ii) Explain in detail catalytic promoters and catalytic poisons. (8)

10. (a) (i) Draw and explain the molecular orbital diagram of CO molecule. (8)
(ii) Explain the electronic spectra of hemoglobin. (8)

(OR)

- (b) Deduce the formulae for distribution law in the case of: (16)
(a) Association of solute in one of the phases
(b) Dissociation of solute in one of the phases

11. (a) (i) Discuss the conformation of cyclohexane. (10)
(ii) Mention the factors that affect the magnitude of rotation. (6)

(OR)

- (b) (i) Explain the geometrical isomerism of oxime. (8)
(ii) Describe the resolution methods to separate the enantiomers from the racemic mixture. (8)

12. (a) Suggest a suitable mechanism for the following reactions: (16)
a) Clemmensen reduction and b) Prins reaction

(OR)

- (b) Deduce a possible mechanism for (16)
a) Wittig reaction and b) Hunsdiecker reaction