Reg. No. | | | | | | | | | | | | | |

B.E./ B.TECH. DEGREE EXAMINATIONS, MAY 2023

Third Semester

CH18305 – APPLIED CHEMISTRY

Chemical Engineering

(Regulation2018/2018A)

TIME:3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Apply the principles of Surface Chemistry in various fields such as Pollution abatement, Catalysis.	**3**
CO 2	Infer the bond order and the bond strength of molecules.	**4**
CO 3	Apply the Distribution Law in solvent extractions.	**3**
CO 4	Perform asymmetric synthesis and resolution.	**3**
CO 5	Handle the air sensitive compounds in organic reactions.	**3**

PART- A (10x2=20Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Distinguish absorption and adsorption.	**1**	**2**
2.	Define adsorption isotherm?	**1**	**2**
3.	Write the bond order for hydrogen fluoride.	**2**	**1**
4.	How a coordination bond is formed?	**2**	**1**
5.	Write the Nernst distribution law.	**3**	**1**
6.	Mention an example for solute association in a solvent phase.	**3**	**1**
7.	Draw the Newman projection of eclipsed conformation for ethane.	**4**	**2**
8.	What are enantiomers?	**4**	**2**
9.	Write an example for Clemmenson reduction.	**5**	**1**
10.	Write the preparation of a phosphorous ylide.	**5**	**1**

PART- B (5x 14=70Marks)

			Marks	CO	RBT LEVEL
11. (a)	**(i)**	Derive the Langmuir adsorption equation.	**(7)**	**1**	**3**
	(ii)	Distinguish between the physical and chemical adsorption.	**(7)**	**1**	**3**

(OR)

(b)		Elaborate the application of the phenomena adsorption in pollution abatement.	**(14)**	**1**	**3**
12. (a)	**(i)**	Outline the postulates of molecular orbital theory.	**(7)**	**2**	**4**
	(ii)	Discuss and analyze the electronic spectrum of chlorophyll.	**(7)**	**2**	**4**
		(OR)			
(b)	**(i)**	Illustrate the molecular orbital diagram of nitrogen.	**(7)**	**2**	**4**
	(ii)	Explain the various absorptions in the electronic spectrum of heamoglobin.	**(7)**	**2**	**4**
13. (a)	**(i)**	Explain the determination of partition coefficient of iodine in carbon tetrachloride and water.	**(7)**	**3**	**3**
	(ii)	Explain the conditions for the validity of Nernst distribution law.	**(7)**	**3**	**3**
		(OR)			
(b)	**(i)**	Apply the modified Nernst distribution law for the solute interaction with the solvent.	**(7)**	**3**	**3**
	(ii)	Explain the application of Nernst distribution law in the solvent extraction process.	**(7)**	**3**	**3**
14. (a)		Analyze the conformation of substituted cyclohexane.	**(14)**	**4**	**4**
		(OR)			
(b)		Explain briefly about the resolution of racemic mixture into the enantiomeric components.	**(14)**	**4**	**4**
15. (a)	**(i)**	Explain in detail about the Mannich reaction with an example.	**(7)**	**5**	**3**
	(ii)	Explain the decreasing of the length of a carbon chain by one unit with Hunsdiecker reaction.	**(7)**	**5**	**3**
		(OR)			
(b)	**(i)**	Explain briefly the steps in Birch reduction.	**(7)**	**5**	**3**
	(ii)	Deduce the mechanism of Prins reaction.	**(7)**	**5**	**3**

PART- C (1x 10=10Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	Explain in detail about the conversion of an alkene to alcohol by hydroboration-oxidation reaction?	**(10)**	**5**	**5**