A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 54905

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2019

Fourth Semester

Chemical Engineering

15UCH405-CHEMICAL PROCESS INDUSTRIES II

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which of the following is used as a bleaching agent for the pulp? CO1- R

   (a) NaOH (b) H_2O_2 (c) NaCl (d) Benzoyl peroxide

2. _____ is used to adjust pH in the production of sucrose. CO1- R

   (a) SO_2 (b) H_3PO_4 (c) NH_3 (d) CO_2

3. _____ catalyst is used in the hydrogenation of oil. CO2- R

   (a) $NiCO_3$ (b) $Ni(HCOO)_2$ (c) $Ni(OH)_2$ (d) $NaAlO_3$

4. Soaps are originally made from _____. CO2- R

   (a) Animal fats and vegetable oils (b) Proteins

   (c) Acids and caustic soda (d) Both (a) and (b)

5. Gasoline yield in catalytic reforming of naphtha may be about _____ % by weight. CO3- R

   (a) 85 (b) 65 (c) 50 (d) 98

6. Which of the following hydrocarbon series are almost absent in crude petroleum? CO3- R

   (a) Paraffins (b) Naphthenes (c) Aromatics (d) Olefins

7. _____ polymers cannot be recycled. CO4- R

   (a) Thermoplasts (b) Thermosets (c) Elastomers (d) Both (b) and (c)

8. The monomers of Buna-N are _____. CO4- R

(a) Styrene and Butadiene (b) Butadiene and acrylonitrile

(c) Butadiene (d) Isoprene and acrylonitrile

9. _____ is a synthetic fibre used for making woolen clothes. CO5- R

(a) Acrylic (b) Polyester (c) Cotton (d) Cellulose

10. Viscose rayon filaments are produced through the process of manufacturing known as _____. CO5- R

(a) Solution spinning (b) Melt spinning (c) Gel spinning (d) Dry jet wet spinning

PART – B (5 x 2 = 10 Marks)

11. Define pulp and pulping. CO1- R

12. What are detergent builders? Name few detergent builders. CO2- U

13. What is petroleum precursor? CO3- U

14. Define vulcanization. CO4- R

15. What is Nylon 6,6? Write the chemical involved in the manufacture of nylon. CO5- U

PART – C (5 x 16= 80 Marks)

16. (a) (i)With a neat sketch of flow diagram, outline briefly the production of pulp by Kraft process involving various processes like digestion, bleaching and finishing operations. CO1- U (10)

(ii) Explain briefly about the recovery of various chemicals from black liquor during the production of pulp. CO1- U (6)

Or

(b) (i) Discuss briefly the production of starch from maize kernels with a neat flow diagram. CO1- U (8)

(ii) Draw a neat flow sheet and explain the production of dextrin by starch hydrolysis process in a fluidized bed. CO1- U (8)

17. (a) (i) Illustrate the chemical reactions, various catalyst production and process involved in the hydrogenation of oil with a neat flow diagram. CO2- U (9)

(ii) Explain briefly the solvent extraction method of vegetable oil with a flow sheet. CO2- U (7)

Or

	(b)	(i) Discuss briefly the production of soap by continuous hydrolysis and saponification process with a neat sheet of flow diagram.	CO2- U	(10)
		(ii) What is a detergent? Classify and explain the various synthetic detergents based on anionic, cationic and non-ionic compounds.	CO2- U	(6)
18.	(a)	(i) With a neat diagram of flow sheet, explain briefly the production of methanol from synthesis gas.	CO3- U	(8)
		(ii) Explain the production of phenol by cumene process with a neat flow sheet.	CO3- U	(8)
		Or		
	(b)	Describe briefly the chemical reactions, process involved in the production of ethylene and acetylene by steam cracking process with a neat flow diagram. Write the major engineering problems involved during the production.	CO3 U	(16)
19.	(a)	(i) Bring out the differences between thermoplastic and thermosetting resins.	CO4- U	(8)
		(ii) Explain briefly about the various polymerization techniques with a suitable example. (i) Addition polymerization (ii) Condensation polymerization (iii) Copolymerization	CO4- U	(8)
		Or		
	(b)	(i) What is synthetic rubber? Discuss briefly the preparation and properties of SBR and NBR.	CO4- U	(10)
		(ii) Write a short note on the process involved in vulcanization of rubber.	CO4- U	(6)
20.	(a)	(i) Outline the production of viscose rayon with a neat sheet of flow diagram.	CO5-U	(8)
		(ii) Explain briefly about the preparation and properties of polyamides with a suitable example.	CO5-U	(8)
		Or		

(b) (i) Discuss the preparation and commercial properties of polystyrene. CO5-U (8)

(ii) Explain briefly the preparation and properties of low density polyethylene. CO5-U (8)