

Roll No: -----



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B.Tech, Chemical Engineering
Subject (Course): Engineering Chemistry
Course Code : CHEG205
No. of page/s: 2

Semester – III
Max. Marks : 100
Duration : 3 Hrs

Section A – [4×5 = 20 marks] (ALL questions are compulsory)		
1.	Mention major products of chlor-alkali industry. List their main applications	[4]
2.	Describe the manufacturing process of nitric acid by ammonia oxidation process	[4]
3.	What is Kraft liquor cycle? Explain with the help of a diagram	[4]
4.	Explain the catalytic reforming process. What is doctors sweetening process for gasoline treatment	[4]
5.	Discuss the placement of catalytic reforming process in a refinery.	[4]
SECTION B – [10×4 = 40 marks] (Attempt Any FOUR)		
6.	(a) What is the difference between unit process and unit operation? Discuss with examples. (b) Along with the knowledge of unit processes and unit operation, what other information needed for the development of a process and its commercialization?	[10]
7.	Compare and contrast chemical pulping processes (sulfate and sulfite pulp) for cellulose fibers	[10]
8.	What are the byproducts of sugar industries? Discuss various environmental issues faced by sugar industries.	[10]
9.	During the chemical recovery from black liquor in pulp manufacture, why do we add make-up chemicals to the mix tank before the smelter?	[10]
10.	The terms hydrotreating, hydroprocessing, hydrocracking and hydrodesulfurization used in	[10]

	petroleum refinery industry. Define these clearly.	
	SECTION C - [2×20 = 40 marks] (Attempt Any TWO)	
11.	(a) Explain, with the help of a neat diagram, the manufacturing of sulfuric acid by contact process (b) List six industrial application of sulfuric acid	[20]
12.	(a) Explain, with the help of process flow diagram, the manufacturing of ethyl alcohol by molasses fermentation. (b) What are the major engineering problems associated with this fermentation process	[20]
13.	(a) Draw a neat-labeled diagram of the overall refinery flow. (b) Write a note on the composition of crude oil. (c) Explain the following terms i) Octane number. ii) Crude distillation unit iii) Flash point.	[20]

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B.Tech, Chemical Engineering
Subject (Course): Engineering Chemistry
Course Code : CHEG205
No. of page/s: 2

Semester – III
Max. Marks : 100
Duration : 3 Hrs

Section A – [4×5 = 20 marks] (ALL questions are compulsory)		
1.	Briefly explain the manufacture of soda ash by Solvay process	[4]
2.	Describe the manufacturing process of ammonia by Haber’s process	[4]
3.	What is an ideal fiber for high-grade paper? Why bamboo and sugarcane make great papers?	[4]
4.	List important factors affecting the large-scale fermentation process	[4]
5.	Explain the importance of the auxillary equipment in efficient functioning of the refinery distillation unit.	[4]
SECTION B – [10×4 = 40 marks] (Attempt Any FOUR)		
6.	(a) What is the difference between unit operation and unit process? (b) How can a chemical production engineer improve the process with respect to yield & quality?	[10]
7.	Explain the production of sulfur by oxidation-reduction of Hydrogen Disulfide. What are the engineering problems associated with this process.	[10]
8.	Compare the various steps involved in production of ethyl alcohol by fermentation and from ethylene	[10]
9.	(a) Draw a flow sheet for the production of paper (b) Explain the role of various functional units involved in the paper making process	[10]
10.	(a) Discuss in detail the classification of crude petroleum. What are the various methods of evaluation of petroleum? (b) Describe isomerization. What is the significance of isomerization process?	[10]

SECTION C - [2×20 = 40 marks] (Attempt Any TWO)		
11.	(a) Explain, with the help of a neat diagram, the manufacturing of sulfuric acid by Lead Chamber process (b) List five industrial application of sulfuric acid	[20]
12.	(a) Explain the manufacturing of ethyl alcohol by fermentation with the help of a process flow diagram. (b) Describe the economics of fermentation process	[20]
13.	(a) Explain in detail the composition of crude oil. (b) What are the various low boiling products of a refinery? (c) Define: i) Cloud Point ii) Flash point iii) Vacuum distillation unit	[20]