

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/Backlog), November-December 2017

B. Tech in Chemical Engineering, Semester VII

Roll No.....

CHE715: Petroleum Refinery and Petrochemicals

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A	Objective type multiple choice questions (10 questions @ 1 mark)	10
i.	Coil visbreaking is: (a) High temp., High residence time cracking (b) High temp., Low residence time cracking (c) Low temp., High residence time cracking (d) Low temp., Low residence time cracking	
ii.	In the manufacturing process of chloromethane, when CH_4/Cl_2 is about 1.8 than what is produced in more amount? (a) CH_3Cl (b) CH_2Cl_2 (c) CHCl_3 (d) CCl_4	
iii.	Write the name of products produced by steam cracking process?	
iv.	Formaldehyde is a chemical compound from _____ group of Petrochemicals. (a) C2 (b) C3 (c) C1 (d) C4	
v.	Catalyst used in catalytic reforming is (a) platinum and alumina (b) nickel (c) iron (d) aluminum chloride	
vi.	Light Naphtha consist of molecules with: (a) 1 to 6 carbon atoms (b) 6 to 12 carbon atoms (c) 4 to 6 carbon atoms (d) 4 to 15 carbon atoms	
vii.	Which process is used to increase the octane number of light naphtha? (a) Alkylation (b) Isomerization (c) Reforming (d) None of these	
viii.	Differentiate between upstream, midstream and downstream processes?	
ix.	Write reaction mechanism of vinyl chloride production?	
x.	Name any two Petrochemical produced from C3 Group Compounds?	
Q.2	Short answer type questions (4 questions @ 2.5 marks)	10
i.	Why we need two shift reactors in methane steam reforming process?	
ii.	Write the name of different petrochemical products we are using in our daily routine life.	

iii.	Given the list of any five refinery and petrochemical industry in India.	
iv.	Why thermal cracking is most preferable for vacuum residue than catalytic cracking?	
Q.3A	Explain atmospheric distillation column to obtain principle fractions. Why we require vacuum distillation column with atmospheric distillation unit?	05
Q.3B	What is delayed coking? Describe the delayed coking operation with diagram.	05
Q.4A	Differentiate between Hydrotreaters and Hydrocrackers. Explain the process of naptha hydrotreating with neat diagram.	05
Q.4B	Describe the desalting process and its importance?	05
Q.5A	Explain the terms: (i) Aniline Point (ii) Octane number (iii) API (iv) Smoke Point	05
Q.5B	What are petrochemicals? How they are classified? Describe the manufacturing process of any compound from 'C1 Group of Petrochemicals'?	01 + 04 = 05
Q.6A	Write the different applications of isopropanol. Also describe the process of manufacturing of isopropanol with neat flowsheet.	05
Q.6B	How to produce H ₂ additionally, as the reformer off gas may not be able to meet the H ₂ demands in various hydrotreaters? Explain the process of hydrogen production.	05
OR		
Q.6B	Make a flowsheet of Petroleum Refinery. Show different upgradation processes of fuel with a block diagram representation.	05
Q.7A	Describe the process of manufacture of Ethylene Oxide with neat flowsheet?	05
Q.8A	Discuss the current status of petroleum industry in India. Also write short note on growth of petrochemical sector and challenges ahead.	7+3 = 10
Q.9A	Why should we dehydrate gas? Explain the process of solid bed dehydration.	10
Q.9B	Explain the concept of cracking with their mechanism. Discuss Fluid catalytic cracking in detail with neat sketch. Write the factors that deactivate the catalyst of fluidized bed catalytic cracking?	15
OR		
Q.9B	Describe the process of Hydrocarbon steam cracking with neat flowsheet?	15

***** GOOD LUCK *****