

Name:	 UPES UNIVERSITY WITH A PURPOSE
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2019

Course: Petrochemical Process Technology

Semester: V

Program: B.Tech (CE+RP)

Time 03 hrs.

Course Code: CHCE 3012

Max. Marks: 100

Instructions:

SECTION A

5 X 4 = 20 Marks

S. No.	Question	Marks	CO
Q 1	How are petrochemicals classified? Give an example for each.	4	CO1
Q 2	Calculate the relative rate of decomposition of 1 – C ₄ H ₉ to ethylene and 1-butene.	4	CO2
Q 3	What is Parex process and give its significance?	4	CO3
Q 4	Differentiate between wet spinning and dry spinning.	4	CO4
Q 5	Give any four important benefits of integration of refining with petrochemical production.	4	CO5

SECTION B

4 X 10 = 40 Marks

Q 6	(a) Acrylonitrile is polymerized by anionic addition polymerization using n-butyl lithium as initiator which ionizes to 100%. The initial concentration of monomer and initiator are 1.4×10^{-2} and 1.2×10^{-6} mol/L respectively. If the polymerization proceeds to 85% conversion in 30 minutes, calculate the propagation rate constant, (b) Why both rate and degree of free radical addition polymerization cannot be increased?	6 4	CO2
Q 7	Explain the process of production of syngas by partial oxidation with the help of diagram and give its important advantages. (Or) With the help of flow diagram, describe the process of manufacture of dimethyl terephthalate.	10	CO3
Q 8	What are engineering resins? Give any four examples and explain the process for the manufacture of any one of them.	10	CO4
Q 9	Describe the industrial process of manufacture of nitric acid.	10	CO5

SECTION C

2 X 20 = 40 Marks

Q 10	(a) Describe the process of manufacture of linear alkyl benzene in detail. (b) Describe the manufacturing process of phenol-formaldehyde resin. (Or)	12 8	CO3 CO4
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	(a) Explain the various steps in the manufacture of syngas by the steam reforming and any two improvements of the process. (b) Draw and explain the process of manufacture of styrene-butadiene rubber.	12 8	CO3 CO4
Q 11	(a) Discuss the mechanism of steam cracking and derive its rate equation. (b) With the help of flow diagram, explain the integration of refinery operations with petrochemical production.	10 10	CO2 CO5