

Name:

Enrolment No:

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**
**End Semester Examination, December 2021**
**Course: Petroleum Refining & Petrochemical Technology**
**Program: B.Tech (CE+RP)**
**Course Code: CHGS 3013P**
**Semester: V**
**Time 03 hrs.**
**Max. Marks: 100**
**Instructions: In case of data missing make necessary assumptions**
**Note: The graphical data is provided in Page No. 2 & 3 to solve problem no. 7**

S. No.	SECTION A (6X10=60) (Attempt all questions)	Marks	CO														
Q 1	Explain the growth of the Indian refining industry and the major problems faced by the Indian refining industry in the global market?	10 M	CO1														
Q 2	(a) Define and give the significance of octane number and cetane number (b) What is the difference between ASTM and TBP distillation and give their significance?	(5+5) M	CO2														
Q 3	With a neat sketch explain top reflux and pump around reflux. Write the merits of the pump around reflux over the top reflux.	10 M	CO3														
Q 4	Explain the process of hydrocracking with a neat schematic diagram? What are the various process variables affecting hydrocracking?	10 M	CO4														
Q 5	Explain the catalytic reforming process regarding the following points a) Objective b) Feedstock c) Catalyst used d) Major Reactions e) Process Conditions	10 M	CO4														
Q 6	Give the necessity of product blending. Explain in brief about the parameters to be considered in the octane number blending process.	10 M	CO5														
<b>SECTION B (2X20=40M)</b>																	
(Attempt all questions)																	
Q 7	Whole crude TBP data (API gravity 25) <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Vol. %</th> <th>0</th> <th>10</th> <th>30</th> <th>50</th> <th>70</th> <th>90</th> </tr> </thead> <tbody> <tr> <td>T (°F)</td> <td>160</td> <td>220</td> <td>350</td> <td>415</td> <td>460</td> <td>530</td> </tr> </tbody> </table> (i) Plot the TBP and determine the UOP characterization factor, average boiling point (VABP, MEABP), and weight for the crude oil. (ii) For the TBP range of 20X-5YZ °F, calculate API, M.W, Mid vol.%, Mid boiling point, and Wt based on 500 barrels of whole crude. Where X is the last digit of your roll number and YZ is the last two digits of your SAP ID.	Vol. %	0	10	30	50	70	90	T (°F)	160	220	350	415	460	530	20 M	CO2
Vol. %	0	10	30	50	70	90											
T (°F)	160	220	350	415	460	530											
Q 8	With a neat flow diagram, explain the process of Flexi coking. Also, write the merits and demerits of Flexi coking over the other two coking processes.	20 M	CO4														



