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| <b>Name:</b>         |  |
| <b>Enrolment No:</b> |                                                                                    |

## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

**End Semester Examination, December 2018**

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|----------------------------------------------------------------|------------------------|
| <b>Programme Name:</b> M.Tech. PLE                             | <b>Semester : I</b>    |
| <b>Course Name :</b> Basics of Petro Refining & Petrochemicals | <b>Time: 03 hrs.</b>   |
| <b>Course Code :</b> CHLP7001                                  | <b>Max. Marks: 100</b> |
| <b>Nos. of page(s) :</b> Two                                   |                        |

**Instructions:**

**Note: Attempt all questions from Part – A four from Part-B and two from part-C with internal choice in each of them. Be brief, precise & focused in your answers.**

### SECTION A

| S. No. | Give short answers for Q1 to Q5                                                      | Marks | CO  |
|--------|--------------------------------------------------------------------------------------|-------|-----|
| Q 1    | Refinery Complexity Factor.                                                          | 4     | CO1 |
| Q 2    | Opportunity crudes & their processing                                                | 4     | CO2 |
| Q 3    | Give key specifications of LPG, Motor gasoline, Aviation gasoline, Diesel & Fuel oil | 4     | CO2 |
| Q 4    | ASTM Distillation.                                                                   | 4     | CO2 |
| Q5     | Secondary conversion Processes.                                                      | 4     | CO4 |

### SECTION B

|     |                                                                                                                                                                                                           |    |     |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|
| Q 6 | Describe various types of impurities present in crude oil. Give details of the process technology used to remove the impurities before the crude is feed to the distillation tower for further processing | 10 | CO4 |
| Q 7 | Briefly explain with the help of flow diagram the process and the products obtained from the atmospheric distillation and vacuum distillation units of a crude oil refinery.                              | 10 | CO4 |
| Q 8 | What is the importance of FCC process in a refinery flow scheme? Explain with the help of block diagram and operating parameters the product slate obtained with the low severity FCC operation.          | 10 | CO4 |
| Q9  | Name various process units in the present day Indian Lube Refineries and purpose of each one of them. Describe in brief the current processes used for the manufacture of high quality LOBS.              | 10 | CO3 |

OR

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                              |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------|
|                  | Prepare overall configuration of a typical Petrochemical complex. Describe Indian petrochemical market in term of value chain & optimization. List top five Indian Petrochemical companies & their product profile.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           | <b>CO4</b>                   |
| <b>SECTION-C</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                              |
| Q 10             | India is going for continuous addition of its refining capacity, whereas Europe and USA have not gone for capacity enhancement for the past several years. Give your reasons and perspective views as to how it may affect the overall growth prospects of Indian hydrocarbon downstream industry considering the fact that not only the demand for specific fuel products is on rise but also additionally the demand of the feedstock's for the production petrochemicals is also increasing every year.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>20</b> | <b>CO1</b>                   |
| Q11              | <p>The Indian refining industry is currently apprehensive of shrinkage in the profit margins and competition from in-house and outside companies. To strive for the changes innovation and shift towards modernization is the need of the hour. Oil majors like Exxon-mobil, Shell, BP &amp; Axen have gone in a big way for forward and backward integration of refinery with petrochemical complex. These companies are reporting high profits with this shift in operation. Describe the levels of refining and petrochemical integration, in context with Indian refining/petrochemical business perspective. Describe the drivers, challenges for R&amp;PC integration and how to overcome these challenges to improve profitability</p> <p style="text-align: center;"><b>OR</b></p> <p>Discuss the factors to be considered for setting up a grass root crude oil refinery in India. What various methods you propose for selecting suitable locations? An entrepreneur intends to select best of the site for setting up a mega 15 million tons refinery using high sulfur, high CCR crude oil as feedstock .What would be the likely process blocks you propose &amp; idea about the investment of land, other capital assets, expanses of raw material, utilities, distribution, sale etc.</p> | <b>20</b> | <b>CO3</b><br><br><b>CO1</b> |