



UNIVERSITY OF PETROLEUM & ENERGY STUDIES

End Term Examination-December 2017

Program- Basics of Petro Refining & Petrochem.

Course: M.Tech PLE I (CHPD 7001)

Max. Marks: 100

Duration: 3 hrs

This question paper has two pages.

Attempt all questions from Part-1 and three questions from Part-2, be brief, precise, focused in your answers to be written in order in the answer booklet.

Part –1(2X20 =40 Marks)

Q1 (a) Tick the correct (1X10 =10 Marks)

- i. Which is the most undesirable component in kerosene?
(a) Aromatics (b) Iso-paraffin's (c) N-paraffin's (d) Naphthalene
- ii. Which of the following fraction of a crude oil have the maximum gravity API?
(a) Diesel (b) Gasoline (c) Atmospheric gas oil (d) Vacuum gas oil
- iii. Which is the heaviest crude?
(a) 45 API (b) 36 API (c) 37 API
- iv. Which of the hydrocarbon types has the lowest C:H ratio?
(a) Aromatics (b) Olefins (c) Paraffin's
- v. Which of the following petroleum products has minimum flash point?
(a) Gasoline (b) Kerosene (c) Diesel (d) Fuel oil
- vi. Maximum Sulphur percentage in low Sulphur heavy stock (LSHS) furnace oil is about:
(a) 0.1 (b) 1 (c) 2.5 (d) 3.5
- vii. PYGAS a product of Steam cracking is rich in:
(a) Benzene (b) Ethyl Benzene (c) Isopropyl Benzene (d) Butylene
- viii. The feedstock for the catalytic reforming unit is
(a) Diesel (b) Kerosene (c) Heavy naphtha (d) Reduced crude oil
- ix. A good lubricant should have high:
(a) Viscosity index (b) Volatility (c) Pour point (d) None of these
- x. Octane number of gasoline is a measure of its
(a) Resistance to knock (b) Ignition delay (c) Ignition temperature (d) Smoke point

Q1 (b) Differentiate between: (5x2 = 10 marks)

- i. ISBL & OSBL
- ii. Pour Point & Cloud Point.
- iii. Fire point & Flash point.
- iv. MON & RON.
- v. Viscosity & Viscosity Index.

Q2. Write short notes: (5x4=20 Marks).

- a. ASTM Distillation.
- b. TBP Distillation.
- c. Isomerization process.
- d. Hydro treating.

Part-2 (3X20=60 Marks)

Q3. What is understood by **residue-up-gradation** and its impact on gross Refinery margins (**GRM**)? Briefly give overview of key processes for **up gradation** of petroleum residues and the products including that of value added products obtained from each one of them.

or

Q4. List some catalytic conversion processes used in refinery. Describe in detail fluid catalytic cracking (FCC) process, with block diagram and mention operating conditions with typical products of the process.

Q5. Describe various technology blocks in conventional lube refinery and the purpose of each one of them to produce quality LOBS. What are the emerging technology options to manufacture good quality LOBS in high yields from highly paraffinic crude such as Mumbai high?

Q6. What are the three main sources from which petrochemicals are derived? Give examples of value addition of refinery products to petrochemicals and typical schematic diagram of structure of a petrochemical complex.

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