

B.Tech-7th semester (Chemical)
Petroleum Refinery Engineering

Full Marks: 70

Time: 3 hours

Answer Question No. 1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Make suitable assumptions if necessary.

1. (a) Why Soaker Visbreaking is preferred over Coil Visbreaking ? (2×10)
(b) How Flexi Coking Process is better than Fluid Coking Process?
(c) Why Catalytic Cracking is preferred over Thermal Cracking?
(d) What is the value of Recycled feed temperature in Fluid Coking process?
How this temperature value is decided?
(e) What are the impurities that are present in oil?
(f) What are the various units present in Prefractionation Unit?
(g) What is "Pump around" in Crude distillation Process?
(h) What are the advantages of Zeolite catalyst over amorphous Silica-Alumina catalyst with reference to catalytic cracking ?
(i) What is the importance of catalytic reforming in petroleum industry?
(j) Compare the hydrofluoric acid process and sulfuric acid process for alkylation?
2. (a) Explain briefly about Desalting process? How various physical variables are controlled in this Desalting process? (5)
(b) With a neat labeled diagram draw the various products coming from CDU and VDU along with their boiling temperature range? (5)
3. (a) With a labeled diagram explain Fluid Coking Process? (5)
(b) Write short note on Lubricating oil. (5)
4. (a) Explain the drawbacks of Mendeleev theory and How Organic theory replaced Mendeleev theory? (5)
(b) Write short notes on various Thermal properties of petroleum fraction? (5)
5. With a neat labeled diagram, explain the working of a fluid catalytic cracking (FCC) unit. Explain the variation of all the parameters inside the riser. (7+3)
6. Write the different types of solvent extraction processes and the solvents used in the same. Explain the process of Furfural extraction briefly with a neat labeled diagram? (3+7)
7. What is polymer gasoline? What are the feed stocks and common catalysts used for the production of polymer gasoline? Using a process flow diagram, describe the production of polymer gasoline mentioning all the operating conditions employed.(4+6)
8. Short notes on any two (2×5)
 - a) Visbreaking
 - b) Merox Sweeting Process
 - c) Hydrocracking