



**11677 : Professional Free Elective-II : Petroleum Processing
Technology - II : 8 CH 04**

P. Pages : 2

Time : Three Hours



* 0 8 1 4 *

AW - 3495

Max. Marks : 80

- Notes :
1. Due credit will be given to neatness and adequate dimensions.
 2. Assume suitable data wherever necessary.
 3. Diagrams and chemical equations should be given wherever necessary.
 4. Illustrate your answer necessary with the help of neat sketches.
 5. Discuss the reaction, mechanism wherever necessary.
 6. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) What do you mean by sour and sweet crude oil? 2
 b) What do you mean by basic and non-basic nitrogen bearing hydrocarbon compounds? 4
 Mention one example of each.
 c) Which compounds are treated as impurities in petroleum and petroleum fractions? Why? 7

OR

2. a) What is the general elemental composition of crude oil? 2
 b) Two ring aromatic and naphthoenaromatics are generally found in crude oil. Mention one 5
 example of each with their structural formula and boiling points.
 c) How crude oil is classified according to their Co-relation Index (CI)? Mention the formula 6
 for determining co-relation Index.
 3. a) Why quality control of the petroleum product is necessary? 2
 b) Why volatility of petroleum fuel is considered as one of major property? 4
 c) What do you mean by induction period of gasoline fuel? How it is determined. 7

OR

4. a) By which tests combustion properties of petroleum products are generally evaluated? 4
 b) Name the test methods designed to evaluate storage stability and resistance to oxidation 4
 and corrosive potentialities of petroleum products obtained by processing of crude oils.
 c) Define the term viscosity Index & discuss the significance of this property. 5
 5. a) Why methanol is not commercially blended in gasoline as an oxygenate along with 2
 ethanol, isopropanol and tertiary butanol?

- b) Why desalting of crude oil is necessary? **www.FirstRanker.com** **www.FirstRanker.com** 2
- c) Why isomerization reaction do not take place during thermal cracking operation? 3
- d) What are the principal reactions that occur during the visbreaking operation? 7

OR

6. a) Why diesel fuel specifications include limit on t50 temperature and volatility? 3
- b) Which properties of feedstock are expected to undergo change during thermal cracking operation? 3
- c) Mention the usual dimensions and operating data for an atmospheric distillation unit. 8

SECTION - B

7. a) What are the advantages of Zeolite catalysts over the natural and synthetic amorphous cracking catalysts? 6
- b) How catalytic reforming helps in boosting octane number of gasoline fraction? Discuss with few reactions involved. 7

OR

8. a) What are the objectives of alkylation and isomerization processes? 6
- b) Mention the alkylation reactions involving propylene, isobutylene and isobutane as a feedstock. What is the octane number of product formed? 7
9. Discuss the merox sweetening process in detail with neat sketch of flow diagram along with the chemistry and process parameters involved. 13

OR

10. Discuss the copper chloride sweetening process with the neat sketch of flow diagram. Also mention the process parameters and chemistry involved. 13
11. N-methyl - Z-Pyrrolidone (NMP) is very good solvent for viscosity index improvement of lube oil base stocks. Discuss this process in detail with neat sketch of flow diagram with the process parameters involved. 14

OR

12. Despite the intensive processing of lube oil base stocks for improving the quality of base stocks, why hydro finishing step is required? Discuss this process in detail with neat sketch of flow diagram and process parameters involved. 14
