

**11016 : Petro Chemical Technology-I (Special Technology-I)****4 PC 02**

P. Pages : 2

Time : Three Hours



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AW - 3079

Max. Marks : 80

- Notes :
1. Due credit will be given to neatness and adequate dimensions.
 2. Assume suitable data wherever necessary.
 3. Diagrams and chemicals 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) Name the exploratory and drilling vessel involved in the discovery and drilling of Bombay high deposit. 3
b) What factors are responsible for the exploration activity in the Cambay basin ? 3
c) Name and discuss the various biological and physical methods of petroleum formation. 8

OR

2. a) What is the crude oil throughput of Indian refineries during last three years ? 3
b) When Indian oil corporation was commissioned ? Discuss the objectives of it's formation in brief. 4
c) Explain the Bertheloti and Mendelceff's inorganic theory of petroleum formation in detail with the probable chemical reactions involved. 7
3. a) What are the boiling points of methane, ethane, propane, cyclohexane, iso-octane and toluene ? 3
b) What are the ill effects of N-compounds on petroleum processing and petroleum products? 3
c) What do you mean by "Wobbe Number" ? Discuss the classification of natural gas according to the Wobbe number. 7

OR

4. a) What do you understand by "Sweet" and "Sour" natural gas ? 2
b) What do you mean by basic and nonbasic nitrogen bearing hydrocarbon compounds ? Mention one example of each with structural formula. 4
c) Which compounds are treated as impurities in petroleum and petroleum fractions ? Why ? 7

5. a) "Isomerization of n-paraffins in light naphtha fraction is inevitable ? Explain. 4
- b) What do you understand by carbonium ion ? Discuss the carbonium ion mechanism in detail with the chemistry involved. Also mention the various refining operations that follows this mechanism. 9

OR

6. a) Which feedstock is generally used for hydrocracking process ? Why ? Explain the chemistry involved in this process with suitable reaction. 5
- b) What do you mean by octane number ? How catalytic reforming improves the octane number of low octane gasoline fraction ? Explain with the suitable reactions involved. 8

SECTION - B

7. a) Among the many different petroleum and gas migration processes which may take place within the rock mass, name those which are most important migration processes. 3
- b) What led to the development of geochemical prospecting methods aimed at ascertaining the presence of petroleum and gas deposits ? 4
- c) Discuss the disadvantages of Geological and Geophysical prospecting methods. 7

OR

8. a) Explain the seismic geophysical prospecting method in detail. 7
- b) Combined gravimetric and magneto metric surveys are very important for studying crystalline basement structures. Explain. 7
9. a) Discuss in brief how primary well control system is maintained. 3
- b) What is the fundamental drawback of Rotary drilling ? 3
- c) What are the various types of drill bits ? Compare them with respect to their utility. 7

OR

10. a) While selecting the mud fluid which considerations must be given ? 3
- b) Blow out preventer (BOP) are used to seal off the top of the well in the event of influx of formation fluid in the well during drilling. Mention the types of BOP's and explain how they works. 10
11. Discuss the various advantages and disadvantages of harvesting solar energy in detail. 13

OR

12. Oil transportation is a major industry with range of transportation options available, depending on the situation at hand. The most important methods include pipeline, rail and ship. Each method has its own advantages and is desirable in certain situations. Discuss each method in brief. 13
