

AP-518

**B.Sc. (Part-III) Semester-VI Examination
PETROCHEMICAL SCIENCE**

Time : Three Hours]

[Maximum Marks : 80

Note :— (1) Question No. 1 is compulsory.

(2) Remaining **SIX** questions carry equal marks.

(3) Give chemical equations and diagrams wherever necessary.

1. (A) Fill in the blanks with appropriate words :

- (i) Calorific value of hydrogen is _____ of all hydrocarbon fuel. $\frac{1}{2}$
- (ii) The activity of catalyst depends not only on its chemical composition but to large extent on its _____ . $\frac{1}{2}$
- (iii) _____ is greenhouse gas. $\frac{1}{2}$
- (iv) Surplus amount of gasoline and light gases is obtained by _____ the bigger hydrocarbon molecule into the smaller fragments. $\frac{1}{2}$

(B) Choose the correct alternatives :

(i) The process in which the reactant and catalysts are in same phase is called as :

- (a) Homogeneous catalysis
- (b) Heterogeneous catalysis
- (c) Bio-catalysis
- (d) None of the above ½

(ii) Which of the following is/are fossil fuel/fuels ?

- (a) Coal
- (b) Petroleum
- (c) Natural gas

(d) All of the above ½

(iii) BIS stands for :

- (a) Bureau of Indian Standards
- (b) Bureau of International Standards
- (c) Bureau of Italian Standards
- (d) Board of Indian Standards ½

10. (A) Why propylene has bright future in petrochemical industries ? 4

(B) Focus on the development of cracking technology with example. 6

(C) What is bio-fuel ? Give suitable examples. 2

OR

11. (A) Discuss coal as an alternative to oil. 8

(B) Compare hydrogen and electrical energy. 4

12. Describe physical treatment offers to refinery effluents. 12

OR

13. With the help of flow diagram discuss the effluent water treatment in typical petroleum refinery. 12

(iv) Which of the following are types of pollution ?

- (a) Air Pollution
- (b) Water Pollution
- (c) Soil Pollution
- (d) All of the above ½

(C) Answer the following questions in **ONE** sentence :

- (i) Name any two types of detectors used in chromatographic techniques. 1
 - (ii) In shift converters all CO is converted into CO₂ in presence of which catalyst ? 1
 - (iii) What is Integrated Petrochemical Complex ? 1
 - (iv) Name various kinds of Pollution. 1
2. (A) What is Electromagnetic Spectrum ? Explain different regions of Electromagnetic Spectrum. 6
- (B) Explain UV-Visible Spectrophotometer with respect to principle, theory and applications. 6

OR

3. Discuss principle, theory, working and applications of IR Spectroscopy. 12

4. Discuss the principle, working and utility of following :

(i) IR Spectroscopy 6

(ii) NMR Spectroscopy. 6

OR

5. Explain theory, principle and working of mass spectrometer. 12

6. (A) What is Chromatography ? Draw the diagram showing classification of Chromatographic Method. 6

(B) Describe application of HPLC. 6

OR

7. (A) Describe characteristic features of HPLC. 6

(B) Describe the advantages of TLC. 6

8. (A) What is Catalyst ? Discuss the importance of catalyst. 6

(B) Discuss the role of Polymer in Catalysis with examples. 6

OR

9. Discuss the following in brief with utilities :

(i) Cracking Catalysts 6

(ii) Hydrotreating Catalysts. 6