

AP-447

8. How FCCU are classified ? Give classification of fluidised bed catalytic cracking unit in detail. 12

OR

9. Define the following terms commonly adopted in catalytic cracking :
- Activity
 - Catalyst to oil ratio
 - % Conversion
 - Cycle stock
 - Efficiency
 - Recycle ratio.
10. Discuss the petroleum base method adopted in India for synthesis of butadiene in detail with various solvent involved. 12

OR

11. Which route is assume to be a non-petroleum base route for synthesis of butadiene ? Discuss the same route with catalyst involved, chemistry of reaction and various advantages and limitations. 12
12. (a) What are the various desirable and undesirable reactions involved in catalytic reforming process ? 6
- (b) Which operating conditions has to be adopted for increasing aromatic and isomeric yield in catalytic reforming process ? 6

OR

13. (a) Discuss the use of crystallisation technique in separation of aromatic component in the given feedstock. 10
- (b) What is adductive crystallisation ? Where does it have application ? 2

B.Sc. (Part-II) Semester-III Examination
3S : PETROCHEMICAL SCIENCE

Time—Three Hours]

[Maximum Marks—80

- N.B. :-** (1) Question No .1 is compulsory and carries 8 marks.
 (2) Remaining **SIX** questions carry 12 marks each.
 (3) Give chemical equations and draw diagrams wherever necessary.
 (4) Use of calculator is permitted.

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

- _____ this type of separator is commonly present in FCCU reactor.
- In catalytic reforming _____ reactor is commonly adopted.
- Steam cracking follows _____ mechanism.
- In selective extraction for recovery of butadiene _____ this solvent is commonly adopted. 2

- (B) Choose the correct alternatives :

- (i) Calcination is a technique commonly adopted for :
 (a) Diesel (b) Residue
 (c) Asphalt (d) Petroleum coke.

(Contd.)

(ii) The common feed for catalytic cracking is :

- (a) Straight run gas oil
- (b) Vacuum gas oil
- (c) Crack gas oil
- (d) Residue

(iii) The undesirable reaction in catalytic reforming is :

- (a) Isomerisation
- (b) Cyclisation
- (c) Dehydrogenation
- (d) Dealkylation

(iv) One of the derivative of butadiene is :

- (a) Cyclopentadiene
- (b) Butene
- (c) Isoprene
- (d) Ethyl alcohol

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(C) Answer the following questions in **one** sentence each :

- (i) Which one is non-petroleum route for synthesis of butadiene ?
- (ii) What is the ideal conditions for catalytic reforming ?
- (iii) Define the term 'Carbonium ion'.
- (iv) What is 'Green Coke' ?

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2. Discuss the thermal cracking process with respect to :

- (a) Operating conditions adopted
- (b) Feed material used
- (c) Product obtained
- (d) Main chemical reactions taking place.

12

OR

3. What is free radical ? How it decide the product pattern in thermal cracking ? Hence discuss the mechanism involved in thermal cracking with suitable examples.

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4. (a) What are the various methods of coking ? In India which method is adopted for coking ? Why ?

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(b) Which treatment is given to feed used for coking ? Why ?

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(c) Which technique is commonly used to measure the efficiency of coking unit ? Discuss in brief.

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OR

5. What is splitter ? How it work ? Discuss the utility of splitter in steam cracking process.

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6. (a) What are the various types of catalyst available for catalytic cracking ? Discuss each in detail.

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(b) Why commercial catalyst have different composition than that of traditional catalyst ? Justify your answer.

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OR

7. Discuss the utility of various reactions involved in catalytic cracking in brief with suitable examples.

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