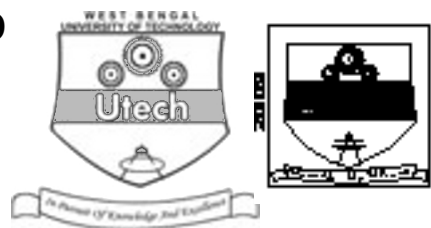


PETROCHEMICAL TECHNOLOGY (SEMESTER - 6)

CS/B.TECH (CHE-N)/SEM-6/CHE-605E/09



1.
Signature of Invigilator

2.
Signature of the Officer-in-Charge

Reg. No.

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Roll No. of the
Candidate

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CS/B.TECH (CHE-N)/SEM-6/CHE-605E/09
ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009
PETROCHEMICAL TECHNOLOGY (SEMESTER - 6)

Time : 3 Hours]

[Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

- This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
- In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
 - For **Groups – B & C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
- Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
- Read the instructions given inside carefully before answering.
- You should not forget to write the corresponding question numbers while answering.
- Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
- Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
- You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
- Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

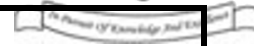
FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A										Group – B					Group – C					Total Marks	Examiner's Signature
Question Number																						
Marks Obtained																						

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Head-Examiner/Co-Ordinator/Scrutineer

6858 (15/06)



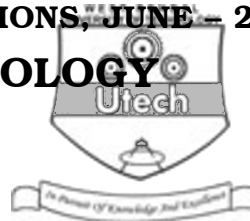
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ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

PETROCHEMICAL TECHNOLOGY

SEMESTER - 6



Time : 3 Hours]

[Full Marks : 70

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

i) Alkylation

- a) causes olefin to combine with each other
- b) causes olefin to combine with iso-paraffin
- c) converts iso-paraffin into olefin
- d) converts olefin into iso-paraffin.

ii) Which of the following hydrocarbons has the poorest oxidation stability ?

- a) Naphthene
- b) Olefin
- c) Paraffin
- d) Aromatic.

iii) Which of the following feedstocks contains maximum sulphur ?

- a) Straight run gasoline
- b) Naphtha
- c) Kerosene
- d) Fuel oil.

iv) Solvent used for azeotropic separation of toluene from a catalytically reformed stock is

- a) ethylene glycol
- b) ethanol amine
- c) methyl ethyl ketone
- d) *n*-hexane.



v) Catalytic oxidation of naphthalene produces

- | | |
|------------|-----------------------|
| a) styrene | b) phthalic anhydride |
| c) phenol | d) benzene. |



vi) Ethylene glycol is manufactured by the hydrolysis of

- | | |
|--------------|-------------------|
| a) ethylene | b) ethylene oxide |
| c) propylene | d) ethyl alcohol. |

vii) Synthesis gas is a mixture of

- | | |
|------------------------------|-----------------------------|
| a) CO and H ₂ | b) O ₂ and steam |
| c) CO ₂ and steam | d) CO and CO ₂ . |

viii) Steam reforming catalyst is

- | | |
|-------------------------|---|
| a) Ni on silica-alumina | b) H ₂ SO ₄ (conc.) |
| c) TiO ₂ | d) Oleum. |

ix) Isoprene is a product of

- | | |
|-------------------------------|--------------------------|
| a) ethylene and synthesis gas | b) ethylene and acetone |
| c) propylene and acetone | d) ethylene and butanol. |

x) Propylene can be used as a source of

- | | |
|----------------|--------------|
| a) ethylene | b) detergent |
| c) fertilizers | d) resins. |

xi) Polyacetal has the simplest structure of

- | | |
|------------------|----------------|
| a) polyethylene | b) polyethers |
| c) polypropylene | d) polyesters. |

xii) Which of the following is not a polymerization process technique ?

- | | |
|-------------|-------------|
| a) Bulk | b) Solution |
| c) Emulsion | d) Melting. |



5

GROUP – B**(Short Answer Type Questions)**Answer any *three* of the following questions.

3 × 5 = 15

2. What is Fischer-Tropsch synthesis ? Explain its industrial importance. 2 + 3
3. Why is ethylene route adopted commercially for the production of Vinyl chloride monomer than acetylene route ? 5
4. What are the advantages and disadvantages of bulk and solution polymerizations ? 5
5. Explain the objective of Visbreaking. How is overcracking controlled ? 3 + 2
6. What is glass transition temperature ? What is its significance in petrochemical industries ? 3 + 2

GROUP – C**(Long Answer Type Questions)**Answer any *three* of the following questions.

3 × 15 = 45

7. a) Discuss the chemical reactions involved during steam reforming operation of naphtha. What are the factors on which reactivity of steam reforming reaction depends ? 3 + 4
- b) Discuss with a suitable flow diagram the production of synthesis gas by partial oxidation of fuel oil. 8
8. a) What are the major products obtained after thermal cracking of naphtha ? Show the separation scheme of individual component at the downstream of naphtha cracker unit. 2 + 7
- b) What are the main reactions involved in producing glycerine by Daicel process ? Why is this process more popular than the acrolein route of manufacturing glycerine ? 4 + 2



9. a) Name the catalyst used in catalytic reforming of naphtha and mention its function. Discuss the effect of various process variables on the reforming operation of naphtha. 2 + 6
- b) What is pyrolysis gasoline ? How can aromatics be recovered from it ? 2 + 5
10. a) Why is Terephthalic acid used as raw material for polyester fibre production advantageously than Dimethyl terephthalate ? What is its drawback ? Why is two-step process adopted ? 2 + 4 + 2
- b) Describe briefly the manufacturing process of HDPE with a flow sheet using Ziegler-Natta catalyst. 7
11. Write short notes on any *three* of the following : 3 × 5
- a) Oxosynthesis
- b) Delayed coking
- c) BTX recovery process
- d) Step growth polymerization *vs* Chain growth polymerization
- e) Phenol-formaldehyde resin.

END