B(1)

[A-98]

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SARDAR PATEL UNIVERSITY

M. Sc. (Polymer Science & Technology) Semester – IV Examination 2015

Monday, 27th April, 2015

2:30 p.m. to 5:30 p.m.

PS04EPST05: Petrochemicals

Total Marks: 70

Note: (1) Attempt all questions
(2) Figures to the right indicates full marks

Q. 1 **Answer the following** **(8)**

(1) In the butadiene production from acetylene, formaldehyde and _____is used as catalyst in the vapour phase
(a) Zinc oxide/Alumina (b) Copper Acetylide (c) Magnesia with chromium (d) Platinum/Rhenium

(2) Catalytic reformer operates at approximately _____°C, _____psi and LHSV of _____hr^{-1}
(a) 450-500, 50-100, 1-2 (b) 400-425, 50-100, 2-4 (c) 500-525, 400, 4-6 (d) None of these

(3) In petrochemical Industry, _____compounds are known as naphthenes
(a) Alkane (b) cycloalkane (c) aromatic (d) olefins

(4) _____is known as Isohexane
(a) 2,2 – dimethyl butane (b) 2,3 -dimethylbutane (c) 3- methylpentane (d) 2-methyl pentane

(5) _____is the example of basic nitrogen compound
(a) Pyrrole (b) porphirins (c) Indole (d) None of these

(6) Steam to hydrocarbon weight ratio for olefin production is _____for liquid feeds
(a) 0.2 – 0.4 (b) 0.4 – 0.6 (c) 0.8 – 1.0 (d) 1.0 – 1.2

(7) Non catalytic gas phase reactions are carried out in _____reactor
(a) Adiabatic (b) Tabular (c) Fluidised bed reactor (d) Stirred flow reactor

(8) Thermal cracking reaction mechanism are carried out by _____
(a) Anionic (b) Cationic (c) Free radical (d) None of these

Q. 2 **Answer the following (any seven)** **(14)**

(1) How the internal combustion engines work?
(2) Discuss the basic building block process
(3) Discuss the production and uses of ethylene glycol
(4) What is octane number? Discuss the additives used in petrol manufacture
(5) Why petroleum refining is required? Write different fractions from distillation of crude oil
(6) What are the different costing parameters in petrochemical processing? Explain
(7) Discuss the Isomerisation process

(8) Discuss the reforming catalyst
(9) What are the advantages of conversion process?

Q. 3 (a) Which type of distillation is used in crude oil processing? Explain it (06)

(b) Write a note on reactor used in petrochemical process (06)

OR

(b) **Answer the following** (06)

1. Discuss the product separation in petrochemical process technology.
2. Write a note on viscosity breaking process

Q. 4 (a) What is coking process? Explain delayed and fluid coking process (06)

(b) Discuss the production of ethylene with diagram from ethane in steam cracking process. What are the different process variable in steam cracking process? Explain (06)

OR

(b) **Answer the following** (06)

1. Write a note on synthesis, properties and uses of vinyl acetate
2. Write a note on maleic anhydride

Q. 5 (a) Explain the petrochemical process technology with schematic flow diagram which is used in continuous processing of styrene (06)

(b) **Answer the following** (06)

1. Discuss the sulphur and nitrogen containing compound in crude oil composition
2. Write a note on production of butadiene

OR

(b) **Answer the following** (06)

3. Which are the different routes for the production of Isoprene? Explain it
4. Write a note on synthesis, properties and uses of acetic acid

Q. 6 (a) Write and discuss the synthesis, properties and uses of phenol from benzene via cumene (06)

(b) **Answer the following** (06)

1. Discuss the synthesis, property and uses of acetaldehyde
2. Write and discuss the synthesis of Aniline from benzene

OR

(b) **Answer the following** (06)

1. Write a note on synthesis, properties and uses of acrolein
2. Write a note on synthesis, properties and uses of propylene oxide

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