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SARDAR PATEL UNIVERSITY

M. Sc. (Polymer Science & Technology) Semester – III Examination 2016

Thursday, 27th October, 2016

2:00 p.m. to 5:00 p.m.

PS03CPST11: Petrochemicals

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

TOTAL MARKS: 70

Que. 1 Answer the following multiple choice questions.

(8)

- (1) _____ dissolve only paraffinic hydrocarbon and leave out asphaltic material
(a) methanol (b) liquid propane (c) tetramethylene sulphone (d) None of these
- (2) Chlorohydration is the reaction between an olefin and _____
(a) Hypochlorous acid (b) Propylene oxide (c) Propylene chlorohydrins (d) None of these.
- (3) In petrochemical Industry, _____ compounds are known as naphthenes
(a) Alkane (b) cycloalkane (c) aromatic (d) olefins
- (4) _____ is the example of acidic sulphur compound
(a) Dimethyl sulfide (b) Thiosyclohexane (c) Cyclohexylthiol (d) None of these
- (5) _____ is the example of basic nitrogen compound
(a) Pyrrole (b) porphirins (c) Isoquinoline (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) _____ process extract aromatics from kerosenes and produce low aromatic jet fuels
(a) Rectisol (b) selexol (c) liquid propane (d) sulfolane
- (8) In the butadiene production from acetylene and formaldehyde _____ is used as catalyst in the vapour phase
(a) Zinc oxide/Alumina (b) Copper Acetylide (c) Magnesia with chromium (d) Platinum/Rhenium

Que. 2 Answer the following (any seven)

(14)

- (1) What is octane number and discuss the additives used in petrol manufacture.
- (2) What is viscosity breaking process and why this process is required?
- (3) Why petroleum refining is required? Write different fractions from distillation of crude oil.
- (4) Discuss the production and uses of formaldehyde.
- (5) How the internal combustion engines work?
- (6) Explain the importance of conversion process.

- (7) Which are the different reformer feed used for catalytic conversion process? Explain it.
(8) Write a note on Urea.
(9) Discuss Nitration of propane.

- Que. 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) What are the compositions of crude oil? Explain it. (06)

- Que. 4** (a) What is coking process? Explain delayed and fluid coking process. (06)
(b) Explain the petrochemical process technology with schematic flow diagram which is used in continuous processing of styrene. (06)

OR

- (b) Answer the following (06)
1. Discuss the different fractions of natural gas liquid (NGL) and write the properties of natural gas liquids.
2. Write a note on thermal cracking reactions.

- Que. 5** (a) Discuss the production of ethylene from ethane in steam cracking process with diagram, reactions and explain its process variables. (06)
(b) Answer the following (06)
1. Which are the different routes for the production of Isoprene? Explain it.
2. Write a note on production of chloromethanes.

OR

- (b) Answer the following (06)
1. Explain the different routes for production of butadiene.
2. Write the synthesis, properties and application of methanol production.

- Que. 6** (a) Why natural gas required treatment process? Explain the acid gas treatment process. (06)
(b) Answer the following (06)
1. Which type of process is used for production of Isopropanol? Explain it.
2. Write and discuss the synthesis, properties and uses of phenol from benzene via cumene.

OR

- (b) Answer the following (06)
1. Write the synthesis, properties and uses of carbon disulfide.
2. Write a note on synthesis, properties and uses of propylene oxide.
