P P SAVANI UNIVERSITY

Third Semester of B. Tech. Examination

May 2019

SECH2030 Unit Processes in Organic Synthesis

23.05.2019, Thursday **Time: 09:00 a.m. To 11:30 a.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

Q - 1 MCQ (Any Five) **[05]**

(i) What is the mixture of nitric acid and sulphuric acid called?

a) Nitrite ion
b) Combined acid
c) Addition acid
d) Mixed acid

(ii) Which one of the following is an addition reaction?

a) $CH_2=CH_2 + HBr$ <----- CH_3-CH_2-Br
b) $CH_2=CH_2 + HBr$ ——> $CH-Br-CH_2-Br$
c) $CH_2=CH_2 + Br_2$ ——> $CH_2-Br-CH_2-Br$
d) All of the mentioned

(iii) In which position does the nitro group enters?

a) Ortho
b) Para
c) Meta
d) All of the mentioned

(iv) Is nitration reaction highly exothermic?

a) True
b) False

(v) What is/ are the major type of equipment for nitration processing?

a) Batch process equipment
b) Continuous process equipment
c) Both of the mentioned
d) None of the mentioned

(vi) In sulfonating, which acid group is used?

a) -OH
b) -SO-OH
c) $-SO_2-OH$
d) $-SO_3-OH$

(vii) In which of the following reaction is halogenation involved?

a) Addition
b) Substitution
c) Replacement
d) All of the mentioned

Q - 2 (a) Discuss the kinetics and mechanism of aromatic nitration process. **[05]**

Q - 2 (b) How mixed acid can affect the different parameters while designing the nitrator. **[05]**

OR

Q - 2 (a)	Explain the D.V.S. value with suitable examples.	[05]
Q - 2 (b)	Discuss the comparison criteria for batch and continuous nitration process.	[05]
Q - 3 (a)	Elaborate chemical process kinetics and factors affecting it.	[05]
Q - 3 (b)	Explain schimid nitrator with construction and working principle.	[05]

OR

Q - 3 (a)	Discuss the construction and working of biazz nitrator.	[05]
Q - 3 (b)	Describe uses of sulfonating and sulfating agents in the chemical industries with their applications.	[05]
Q - 4	Attempt any one.	[05]
(i)	Explain continuous process for manufacturing of aniline from nitrobenzene using catalytic fluidized bed reactor.	
(ii)	What is the relation of thermochemistry with organic chemistry in terms of temperature ?	

SECTION – II

Q - 1 MCQ (Any Five) [05]

(i) Which of the following is an oxidizing agent?

a) $KMnO_4$
b) NaOH
c) CO
d) All of the mentioned

(ii) The solubility of ammonia in water is influenced by what?

a) Temperature
b) Pressure
c) Temperature & Pressure
d) None of the mentioned

(iii) Amines can be produced by the reduction of what compound?

a) Nitro
b) Oximes
c) Azoxy
d) All of the mentioned

(iv) Which is the most widely used sulfonating agent in Industries?

a) Oleum
b) Sulphur dioxide
c) Sulfuric acid
d) Mixed Acid

(v) What is the advantage of continuous hydrolysis?

a) Uniform reaction
b) High production rate
c) Uniform reaction & High production rate
d) None of the mentioned

(vi) Why is aq. NH_3 used as an amminating agent in majority of cases?

a) Handling
b) More energy
c) Lower reaction rate
d) All of the mentioned

(vii) Which type of materials soften on heating and regains its original shape on cooling?

a) Thermoplastics
b) Thermosetting

c) Rubber
d) All of the mentioned

Q - 2 (a)	Write in brief the process of manufacturing of Industrial hydrogenation of fat and oil.	**[05]**
Q - 2 (b)	Alcoholic group is the pioneer source for preparation of acetic acid. Explain any one process.	**[05]**
	OR	
Q - 2 (a)	Explain gas catalytic hydrogenation and hydrogenolysis and factors affecting it.	**[05]**
Q - 2 (b)	Hydrogen and carbon dioxide are the biggest source to manufacture methanol at industrial scale. Explain.	**[05]**
Q - 3 (a)	How the acetaldehyde and acetic acid is related to each other ?	**[05]**
Q - 3 (b)	Describe processing of ethanol from ethylene using shell process.	**[05]**
	OR	
Q - 3 (a)	Discuss manufacturing process of phenol from benzene sulfonic.	**[05]**
Q - 3 (b)	Explain vapor phase oxidation of naphthalene.	**[05]**
Q - 4	Attempt any one.	**[05]**
(i)	Write the oxidation reaction of manganese oxide to produce toluene as product. Elaborate the statement through manufacturing process.	
(ii)	Conversion of starch to dextrose is industrial process. Which factors affecting them ?	

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