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**SARDAR PATEL UNIVERSITY**  
**BSc (V Sem.) Examination**  
**Friday, 15 November 2013**  
**10.30 am – 1.30 pm**  
**US05CICH02 – Industrial Chemistry**  
**Unit Process in Organic Manufacture**

Total Marks: 70

Note: Figures to the right indicates full marks.

Q.1 Choose the correct option and write in the answerbook. [10]

- (1) Which one of the following is a unit operation?  
 (a) Oxidation (b) Coupling  
 (c) Electrolysis (d) Drying
- (2) Which of the following is reducing agent?  
 (a) alkaline  $H_2O_2$  (b) Caro's acid  
 (c) Fe + acid (d)  $KMnO_4$
- (3) A vortex type of agitation is done in \_\_\_\_\_  
 (a) Schimidnitration (b) Biazzi nitration  
 (c) Both of them (d) None of them
- (4) Conversion of alcohol to an aldehyde is an example of \_\_\_\_\_  
 (a) Oxidation (b) Alkylation  
 (c) Reduction (d) Esterification
- (5) Fuming sulphuric acid is \_\_\_\_\_  
 (a)  $H_2SO_4 + H_2O$  (b)  $H_2SO_4 + Cl_2$   
 (c)  $H_2SO_4 + SO_3$  (d) All of these
- (6) An introduction of  $-SO_2Cl$  group into alkane is known as  
 (a) Halosulfonation (b) Sulfochlorination  
 (c) Sulfonation (d) All of these
- (7)  $CH_2 = CH_2 + Cl_2 \xrightarrow{FeCl_3} (?)$   
 (a)  $Cl - CH_2 - CH_2 - Cl$  (b)  $Cl - CH = CH - Cl$   
 (c)  $Cl - CH = CH_2$  (d) All above
- (8) \_\_\_\_\_ is by for the most commonly used Catalyst in oil hardening.  
 (a) Al (b) Cu  
 (c) Ni (d) Hg
- (9) The rate of esterification in case of alcohol is \_\_\_\_\_  
 (a)  $1^\circ > 2^\circ > 3^\circ$  (b)  $3^\circ > 2^\circ > 1^\circ$   
 (c)  $2^\circ > 3^\circ > 1^\circ$  (d)  $1^\circ > 3^\circ > 2^\circ$
- (10) \_\_\_\_\_ is not hydrolysis agent.  
 (a) Water (b) Water + acid  
 (c) Water + alkali (d) Benzene

Q.2 Answer in brief: (any ten): [20]

- (1) Give function of  $H_2SO_4$  in mixed acid.
- (2) Write the effect of nitrous acid on nitration.
- (3) Define the term partial reduction and give its reagent.
- (4) Define the terms Sulfonation and Sulfation.

- (5) Explain chromic acid as an oxidizing agent.
- (6) Explain liquid phase oxidation.
- (7) Define the term hydrogenation.
- (8) Write reactions for chlorination by addition and substitution reaction.
- (9) Enlist various Fluorination reaction.
- (10) Define the term Esterification by giving suitable example.
- (11) Define the term transesterification.
- (12) Give mechanism of Fridel-Craft acylation.

Q.3 Write a note on oxy nitration. Also compare the batch nitration with continuous process. [10]

**OR**

Q.3 Discuss manufacture process of aniline by Bechamp reduction. [10]

Q.4

(A) Discuss the commercial manufacture of benzene sulphonic acid by Barbet process. [07]

(B) Explain permanganates as oxidizing agent. [03]

**OR**

Q.4

(A) Write a note on oxidizing agents. [05]

(B) Discuss various types of oxidative reactions. [05]

Q.5

(A) Discuss different methods of Chlorination reaction. [05]

(B) Discuss hardening of Vegetable Oil. [05]

**OR**

Q.5

(A) Discuss the commercial manufacture of Chlorobenzene. [06]

(B) Write reaction mechanism for electrophilic substitution chlorination reaction. [04]

Q.6

(A) Discuss various types of hydrolysing agents. [06]

(B) Discuss Catalytic esterification. [04]

**OR**

Q.6

(A) Discuss manufacture of ethyl acetate. [07]

(B) Give mechanism of hydrolysis type  $BAC_2$ . [03]

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