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SARDAR PATEL UNIVERSITY

M. Sc. Semester - IV Examination

Saturday, 23rd March 2019

INDUSTRIAL CHEMISTRY

Subject: Technology of chemical process industries

Date: 23/03/2019, Saturday **Course No. : PS04CICH12/24**

Time: 02:00 p.m. to 05:00 p.m. **Marks: 70**

Q. 1 Answer the following MCQs (Attempt all) **[08]**

i. Pigment imparts colour and ____ to the medium
   (a) Transparency (b) Solubility
   (c) Conductivity (d) Opacity

ii. The sulphate process for TiO2 production utilizes____ ore.
   (a) Rutile (b) Ilmenite
   (c) Bauxite (d) Kaomite

iii. Glass transition temperature increases in the polyester by the presence of
   (a) Aliphatic structure (b) Aromatic structure
   (c) Both a & b (d) None

iv. The yellowing in linseed is due to the presence of
   (a) Double unsaturated linoleic acid (b) Triple saturated linoleic acid
   (c) Triple unsaturated linoleic acid (d) Double saturated linoleic acid

v. The resins may only be water soluble or water dispersible with difficulty when it has:
   (a) Very high acid value (b) Low acid value
   (c) High iodine value (d) None

vi. Which of these is not a blocking agent in the polyurethane systems:
   (a) Malonates (b) Phenols
   (c) Ɛ-Caprolactum (d) Vegetable oils

vii. Wurtz synthesised urethane by reacting a mono-functional alcohol and
   (a) Isocyanates (b) Sulphate
   (c) Sulfamate (d) None

viii. Epoxy resin is formed by the reaction of ____.
   (a) Melamine and formaldehyde (b) Epichlorohydrin and bis-phenol A
   (c) Carboxylic acid and polyol (d) Di-isocyanates and diol

Q.2 Answer the following short question (Any seven) **[14]**

I. What are inorganic pigments? Give examples.
II. Differentiate between dyes and pigments.
III. Define alkyd resin.
IV. Define the amine hardening system for epoxy resin.
V. Enlist the qualities of ideal blocking agent for isocyanates.
VI. Differentiate between Resole and Novolac PF resins.
VII. Define fertilizer and give its classification based on their nutrient content.
VIII. Describe the type of soils.
IX. What are fumigants?

Q.3	(a)	With the help of flow diagram explain manufacture of titanium dioxide by sulphate process.	[06]
	(b)	What is organic pigment? Give the detailed classification with application.	[06]
		OR	
	(b)	Write explanatory note on azo-pigments.	[06]
Q.4	(a)	Give the classification of alkyd resins.	[06]
	(b)	Describe the fatty acid process for manufacturing of alkyd resin.	[06]
		OR	
	(b)	With the help of flow diagram explain the manufacture of saturated polyester resin.	[06]
Q.5	(a)	Give the application and properties of epoxy resins.	[06]
	(b)	Describe the polyurethane coating systems of solvent Bourne two pack reactive coatings.	[06]
		OR	
	(b)	With the help of flow diagram explain manufacture of epoxy resin.	[06]
Q.6	(a)	Describe the functions of important nutrients for plants.	[06]
	(b)	Write a note on natural insecticide.	[06]
		OR	
	(b)	With the help of flow diagram explain manufacture of single super phosphate.	[06]

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