

(A- 91) **SARDAR PATEL UNIVERSITY**  
**M.Sc. 4<sup>th</sup> Semester (Surface Coating Technology) (CBCS) Examination**  
**Saturday, April 18<sup>th</sup>, 2015**  
**Time: 02:30 pm to 5:30 pm**  
**Course No.: PS04CSCT01**  
**Subject: Technology of Resins for Surface Coatings - II**

Total Marks: 70

- N.B. (1) Marks allotted to the question are on its RHS  
 (2) Illustrate your answers wherever necessary with the help of neat sketches & chemical equations

- Q.1 Choose the correct answer from the followings:
- Q.1.1 Chlorinated rubber is a \_\_\_\_\_, non-toxic, tasteless white powder which is a fast drying binder with low chemical reactivity and dissolves freely in solvents. 1  
 (a) Non-flammable (b) Highly flammable (c) Inflammable (d) Ignitable.
- Q.1.2 The viscosity of Nitrocellulose solutions is of great importance and is measured in \_\_\_\_\_. 1  
 (a) Efflux viscometer (b) Brookfield viscometer  
 (c) Falling Sphere viscometer (d) U-Tube viscometer
- Q.1.3 \_\_\_\_\_ based liquid epoxy resins have much lower viscosities for same 'n' than their corresponding BPA resins. 1  
 (a) BPF (b) Halogenated Epoxy resin (c) Epoxy Novalac resins (d) Phenoxy resins.
- Q.1.4 \_\_\_\_\_ find major usage in concrete coatings. 1  
 (a) Amido polyamine (b) Aromatic Polyamine  
 (c) Aliphatic Polyamine (d) Ethoxylated Amine Adducts
- Q.1.5 \_\_\_\_\_ can acts as a catalyst in Epoxy - Polyamide cure system. 1  
 (a) NaOH (b) DBTDL (c) DMP-30 (d) None of these
- Q.1.6 The drying rate of \_\_\_\_\_ coatings is dependent on the relative atmospheric humidity and the temperature. 1  
 (a) Blocked Polyisocyanate (b) moisture cure urethane (c) 2K urethane (d) PUD's
- Q.1.7 *Basonat* – Polyisocyanate for coatings is the trade name of which company \_\_\_\_\_. 1  
 (a) Rhodia (b) Bayer (c) BASF (d) Akzo Nobel Resins.
- Q.1.8 \_\_\_\_\_ of General Electric found a direct method of preparing Silicones from Si & MeCl. 1  
 (a) Rochow (b) Dr. J. Franklin Hyde (c) Ladenburg (d) Berzelius
- Q.2 Answer any Seven of the following short questions: 14
- Complete the following chemical reaction:  
 (a)  $R-NCO + R^1-COOH \rightarrow$   
 (b)  $R-NCO + R^1-NH_2 \rightarrow$   
 (c)  $R-NCO + H_2O \rightarrow$
  - What are Polyurethane resins? Give their classification as per ASTM standard based on their curing mechanism.
  - Calculate Theoretical % NCO content for TDI, HDI and IPDI respectively.
  - Calculate Theoretical Amine Value for EDA,DETA and TETA respectively
  - Write the role and types of Reactive Diluent currently find use in Epoxy resin.
  - Schematic representation of the Preparation of an Epoxy Phosphates.
  - "Grafting from" and "Grafting onto" in Epoxy Acrylic Polymer backbone.
  - Monofunctional acids are used in the manufacture of Polyamides.
  - For what reason diisocyanates are transformed into Oligomers?

- Q.3 a Describe the various curing agent used in epoxy coating. Explain ambient temperature cure and heat cure epoxy paints. Discuss type and curing agent used in both condition giving example. 6
- Q.3 b Write a note on Epoxy Acid esters with no Acrylic Functionality. 6
- Or**
- Q.3 b List the Epoxy resins which are not based on Bisphenol A and explain in detail one of them. 6
- Q.4 a Write the preparation and uses of Oil modified urethanes in surface coatings. 6
- Q.4 b Write a note on Polyurethane Dispersions (PUD's) 6
- Or**
- Q.4 b Write a note on Waterborne Polyisocyanate. 6
- Q.5 a Explain the three step synthesis of Silicone from sand 6
- Q.5 b How Silicone fluids are distinguish from common organic fluids? 6
- Or**
- Q.5 b Explain Silicone Modified Alkyd resins. 6
- Q.6 a Write a note on Chlorinated rubber used in Paint Industry. 6
- Q.6 b Give the recipe of Reactive Polyamide resin, its properties and uses. 6
- Or**
- Q.6 a Write a note on Nitrocellulose Resin used in Paint Industry. 6
- Q.6 b Give the recipe of Non-Reactive Polyamide resin, its properties and uses. 6