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SEAT No. _____

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SARDAR PATEL UNIVERSITY

M.Sc. 3rd Semester (Surface Coating Technology) (CBCS) Examination

Monday, 25th March 2019

Time: 02:00 pm to 05:00 pm

Course No.: PS03CSCT23

Subject: Technology of Architecture Coatings, Industrial Coatings and Construction Chemicals

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

Choose the **Correct Answer** from the followings:

- Q.1. 1 What is ideal PVC (% vol) for latex glossy enamel? (1)
(a) 15-30 (b) 10-15 (c) 30-50 (d) 25-35
- Q.1. 2 NC Putty contains high amount of _____? (1)
(a) Plasticizer (b) Extender (c) Drier (d) Red Oxide Pigment
- Q.1. 3 In Alkyd (CG-32) Amino (MF) stoving enamel what is Alkyd: Amino ratio proportion by weight? (1)
(a) 1:1 (b) 3:1 (c) 4:1 (d) a & b both
- Q.1. 4 Styrene is used as a _____ in formulation of knifing filler. (1)
(a) Antiskinning agent (b) Hardener (c) Filler (d) Reactive Diluent
- Q.1. 5 The viscosity of NC solution is normally measured in _____ viscometer. (1)
(a) Ford Cup B₄ (b) Hoeppler (c) Gardner (d) Stormer
- Q.1. 6 Zinc rich primers are formulated at (1)
(a) Above CPVC (b) Below CPVC (c) CPVC (d) none of these
- Q.1. 7 _____ is used as Air-release agent in Powder Coating formulations. (1)
(a) Polyacrylates (b) Poly(dimethyl) siloxanes (c) Benzoin (d) Polypropylene
- Q.1. 8 Poor flow (___ look), short or long waviness of powder coat layer, noticeable only after curing. (1)
(a) Orange peel (b) Drip Development (c) Blistering (d) Pin Holes
- Q.2 Attempt **any Seven** Questions (14)
- (a) Write the requirements for Zinc dust for making sacrificial primer.
- (b) What is the role of dehydrating agents used in Zinc Rich Epoxy Ester Primer?
- (c) Discuss the effects of CPVC (below and above) on the properties of the film.
- (d) Discuss about MFFT.
- (e) Illustrate the curing reaction mechanism at elevated temperature between short oil alkyd and butylated amino resins
- (f) Write about Fluidized bed process.
- (g) Draw neat diagram for Manufacturing of Powder Coating.
- (h) Write the role of additives as ingredients in water based paints.
- (i) Distinguish between Coalescing agent and Co-solvent by giving suitable examples.

- Q.3 a Develop formulations for : (6)
- Stoving topcoat, White
 - P/B = 0.6 : 1 (Pigment/Binder ratio)
 - AK : MF = 7 : 3 (solids/solids)
 - Non-volatiles content (solids) as delivered (about 80 s, Ford cup 4): 63 %
- Alkyd resin (AK) : short-oil, non-drying, non-yellowing (70% in xylene),
 Melamine resin (MF): reactive melamine resin (55% in alcohols)
- Calculate PVC, %Volume Solid
- Q.3 b Write a note on Classification of Coatings (6)
- OR
- Q.3 a Develop formulations for two oxidative-cure alkyd paints which differ significantly in the amount of pigment (PVC). The pigment to binder ratio has to be a) 2.5: 1 and b) 3.8: 1. The NVM= 85 wt. %. The pigmentation is to consist of red iron oxide and an extender in the ratio 1: 1. GIVEN: Long oil alkyd (100%) Pigment: red iron oxide, $p = 5.1 \text{ g/cm}^3$, Extender: BaSO_4 , $p = 4.1 \text{ g/cm}^3$ Solvents: white spirit, xylene, butanol, methoxypropyl acetate, Drier: Co-Oct (6%), Pb -Oct (18%) and Ca - Oct (3%), Anti-skinning additive: MEKO, Dispersing agent (6)
- Q.3 b Write formulation of Zinc chrome yellow primer for aluminum and other alloy and calculate all values. (6)
- Q.4 a Write a note on Zinc Rich Primer (6)
- Q.4 b Write a note on Varnishes. (6)
- OR
- Q.4 b Write a note on Multicoat systems? (6)
- Q.5 a Why thickener is used as formulating ingredients in water based paint, classify? (6)
- Q.5 b List the parameters and properties of architectural coating binders. Discuss any one of them. (6)
- OR
- Q.5 b Distinguish the properties between Water soluble; Aqueous dispersion and Colloidal dispersion polymers. (6)
- Q.6 a What is Powder Coating? Write its advantages and disadvantages. (6)
- Q.6 b Why Choose Powder Coating Over Traditional Solvent Based Paints? (6)
- OR
- Q.6 b Discuss the resins systems used in Powder Coatings? List various Test methods for Powder Coatings (6)