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SEAT No. _____

No. of Printed Pages: 02

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SARDAR PATEL UNIVERSITY

M.Sc. 2nd Semester (Surface Coating Technology) (CBCS) Examination

Monday, April 16th, 2018

Time: 10:00 am to 01:00 pm

Course No.: PS02CSCT23

Subject: Coating Properties and Analysis of coatings

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 Which of the following is not a rheological parameter? 1
(a) Shear Rate (b) Bingham Bodies (c) Yield Value (d) Flocculation
- Q.1.2 If Hegmann gauge reading is 7+. What is the reading in micron? 1
(a) 12.7 μ (b) 0.5 μ (c) 50.8 μ (d) 25.4 μ
- Q.1.3 Weight per liter, Kg/ltr is highest in _____. 1
(a) S/G Paint (b) Air Drying Enamel (c) Stoving Enamel Black (d) Red Oxide Primer
- Q.1.4 A pull-off adhesion test is done to measure the resistance of a coating to separate from a substrate applying a perpendicular _____. 1
(a) Tensile force (b) Torsional force (c) Gravitational force (d) none of these.
- Q.1.5 What information can be obtained from accelerated UV exposure 1
(a) Gloss and Color Change (b) Chalking resistance (c) Corrosion Resistance (d) a & b
- Q.1.6 Pick the odd one with respect to corrosion resistance test of coatings 1
(a) Salt Spray Test (c) Protection against corrosion
(b) Salt Water immersion (d) Scratch Hardness
- Q.1.7 If viscosity in poise is 3.0 of varnish of specific gravity of 0.93. What is the viscosity in stoke? 1
(a) 2.99 (b) 3.22 (c) 3.65 (d) 3.00
- Q.1.8 _____ is defined as the Color variable that denotes its departures from greyness. 1
(a) Hue (b) Saturation (c) Chroma (d) b and c both
- Q.2 Answer Any Seven of the Following 14**
- a) Write the phenomena of sagging.
b) Classify the different 'Gloss Values' according to PVC.
c) Outline the different techniques of film formation.
d) Define Viscosity. How will you check viscosity by Ford Cup no. B-4?
e) Name any two methods to determine Elasticity.
f) Name any two methods to determine Hardness.
g) A pigmented coating has wet film opacity of 14 sqmtr / Ltr. At 42% non-volatile by volume. What will be its WFT and DFT?

[P.T.O.]

①

h) Outline the different techniques of film formation.

i) List the physical and chemical causes for the adhesion of coatings to the substrate.

Q.3 a What are the different types of flow? 6

Q.3 b Classify the Viscometer on accuracy of measurement and suitability for flow system. Discuss in detail about Falling Sphere Viscometer. 6

Or

Q.3 b How will you assess Surface Dry, Hard Dry and Tack free stage of oxidative coating drying? 6

Q.4 a Write a note on Film Thickness. 6

Q.4 b Give the importance of % Volume Solids and describe the three categories of Coatings based on %Volume Solids, explain in detail. 6

Or

Q.4 b Enlist the different techniques of Film formation. Illustrate and explain the phenomena of Coalescence. 6

Q.5 a Write about mechanical theory of adhesion of coating to the substrate. 6

Q.5 b What are the different hardness tests? Explain the Koing-Persoz instrument? 6

Or

Q.5 b Match A with B 6

Common Terms (A)	Alternate Terms (B)
1.Touch Dry	a. Cured for Service
2.Newtonian Flow:	b. Time to recoat
3.Shear thinning:	c. Dry to walk on, hard dry, through dry
4.Full Cure	d. Tack-free, Surface dry
5.Dry to Handle	e. Viscosity <i>decreases</i> with the rate of shear.
6.Non-Newtonian Flow:	f. Viscosity <i>increases</i> with the rate of shear
7.Shear thickening	g. Which does not contain constant viscosity
8.Over coating Interval	h. Which have a constant viscosity

Q.6 a Write a note on QUV accelerated weathering. 6

Q.6 b Give the failure appearance, Cause of Failure and Problem solution of settling and gelling in liquid paint. 6

Or

Q.6 b Write about the following defects: 6

(1) Sagging (2) Prolong drying.

X

(2)