

## SARDAR PATEL UNIVERSITY

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

Thursday, 07<sup>th</sup> April 2016

Time: 02:30 pm to 5:30 pm

Course No.: PS03CSCT02

**Subject: Technology of Paint Manufacturing**

**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 following

- Q.1. 1 To Prevent settling in Primer, the primer should have which flow (1)  
 (a) Newtonian (b) Pseudoplastic (c) Thixotropic (d) Dilatant
- Q.1. 2 Soft texture pigments have \_\_\_\_\_ f (PVC). (1)  
 (a) High (b) Low (c) Medium (d) Very Low
- Q.1. 3 Pick the odd one with respect to grinding mechanism. (1)  
 a) Sand Mill (b) HSDD (c) Bead Mill (d) Ball Mill
- Q.1. 4 Glossy Top coats have PVCs of \_\_\_\_\_. (1)  
 (a) 10 to 20 % (b) 20 to 25 % (c) 25 to 30% (d) 30 to 40 %
- Q.1. 5 General composition of Ottawa sand is \_\_\_\_\_. (1)  
 (a) Aluminium oxide (b) Silica (c) Zirconia (d) Silicate
- Q.1. 6 The pigment-binder-ratio for Primer is normally in the range of \_\_\_\_\_. (1)  
 (a) 2.0 to 4.0 : 1.0 (b) 6.0 to 8.0 : 1.0 (c) 4.0 to 6.0 : 1.0 (d) 0.95 to 1.0 : 1.0
- Q.1. 7 Maintenance primers are generally formulated in a  $\Lambda$  range of from \_\_\_\_\_ to \_\_\_\_\_ to secure optimal resistance to rusting and blistering. (1)  
 (a) 0.75 to 0.90 (b) 0.45 to 0.75 (c) 0.50 to 1.00 (d) 1.05 to 1.15
- Q.1. 8 The Pigment / Binder ratio is the \_\_\_\_\_ ratio of the sum of the pigments and filler to the binder solids. (1)  
 (a) W/W (b) W/V (c) V/V (d) V/W
- Q.2 Attempt **any Seven** Questions: (14)  
 (a) Illustrate Agglomerate, Dispersed and Flocculated state  
 (b) Daniel Wet point and Flow point.  
 (c) What are the advantages of Bead Mill?  
 (d) Advantages and disadvantages of Ball mill.  
 (e) Describe technique to ascertain mill base composition in liquid paint manufacture?  
 (f) What are VOCs and how they affect the environment?  
 (g) Define TPM and enlist the pillars of TPM.  
 (h) What are limitations of High speed disk disperser?  
 (i) Write in brief about HAPs.

- Q.3 a (1) Distinguish between PVC & f (PVC). (3)
- (2) Calculate PVC, Wt/ltr and Non-volatile matter in the following paint recipe. (3)

Sr. No.	Ingredients	PbW	W/L
1	Phthalocyanine Blue	8.00	1.7
2	Alkyd Resin-100 % NVM	39.00	1.07
3	Mineral Turpentine	53.00	0.78

- Q.3 b What is meant by CPVC? Explain its implications on four properties of surface coatings. (6)

**OR**

- Q.3 b Formulate glossy white stoving enamel by using short oil alkyd resin (60%NV, Density=0.98 Kg/L) and Melamine formaldehyde resin (60%NV, Density=1.03 Kg/L) as binder and Rutile TiO<sub>2</sub> as pigment (Sp. Gravity = 4.1). Ratio of Alkyd to Amino resin should be 4:1 on weight basis. Select suitable additives & solvents as needed. Pigmentation should not exceed 20%. Calculate theoretical %NVM, %Non Volatile by Volume, Pigment-Binder ratio and density of the formulation. (6)

- Q.4 a List the different factors affecting grinding efficiency of Ball mill. Explain grinding media & mill base factors in detail. (6)

- Q.4 b With neat sketch illustrate construction & working of Sand mill? Give its advantages & Disadvantages (6)

**OR**

- Q.4 b Write the steps of pigment dispersion process & explain about pigment dispersion stabilization mechanism in detail. (6)

- Q.5 a What is mill base let down? Why stabilization should be done before Mill base letdown? Write about different problems arising from improper letdown? What are the practical recommendations for optimum letdown conditions? (6)

- Q.5 b Write note on (1) HSDD (2) Attritor (6)

**OR**

- Q.5 b Write note on (1) Basket Mill (2) Horizontal agitated media mill (6)

- Q.6 a What is LCPVC? How particle size of latex, glass transition temperature (T<sub>g</sub>) of latex and coalescing agent affect LCPVC? (6)

- Q.6 b Write note on 5S. (6)

**OR**

- Q.6 b Explain the different factors which need to be considered while selecting a location of plant for paint industry. (6)