SEAT No._____

S1C

No. of Printed pages: 2

SARDAR PATEL UNIVERSITY

[421] *M.Sc. 2nd Semester (Surface Coating Technology) Examination (CBCS)*

Wednesday, November 1st 2017

Time: 10:00 am to 1:00 pm

Course No. : PS02CSCT02

Subject: Chemistry & Technology of Organic Pigments, High Performance Pigments, Additives & Solvents

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 option.**

(1) In water based system the stabilizing mechanism of the dispersing additives is due to ___. (1)

A. Nonionic Charge
B. Electro Charge
C. Anionic Charge
D. Electrostatic repulsion

(2) Pigment flocculation can be controlled by ____. (1)

A. Polymeric Additive
B. Drier
C. Silicone Additive
D. MEK Oxime

(3) Silicone additive with molecular weight (60 > x > 100) is used as _____. (1)

A. Flow Control
B. Slip Agent
C. Defoamer
D. Hammer Finish

(4) Which of the following is high performance pigment? (1)

A. Phthalocyanine Blue
B. Beta Naphthol Red
C. Diketo Pyrrolo Pyrrol
D. Acetylene Black

(5) In the history of drier technology, driers were prepared with _____ other than octates. (1)

A. Vanadates
B. Oxides
C. Naphthanates
D. Urathenes

(6) Bromine Index indicates the properties of _____, which may cause detoriation of solvent on storage. (1)

A. Saturation
B. unsaturation
C. contaminants
D. purity

(7) While paint manufacturing by changing the order of addition of the drier and antiskinning agent leads to change in _____ of paint. Hence drier is added before antiskinning agent. (1)

A. Colour
B. Smell
C. Drying
D. none of these

(8) Which of the following is violet organic pigment? (1)

A. Thioindigo
B. Isoindolinone
C. Dioxazine
D. Azo Bona Pigment

Q.2 Answer **any seven** of the following (14)

1 What is active drier? How they differ in mechanism than auxiliary drier?
2 Explain the chemistry of defoamers for aqueous and non aqueous coatings.
3 Explain Oximes as antiskinning agent.
4 Why craters formed? Explain with term surface tension.
5 Write in details about solvent balance giving example.
6 Explain KB value of Solvent.
7 Write about fat soluble dyestuff and basic dyestuff.
8 Flocculation leads to instability of pigment dispersion – Justify.
9 Explain why Gloss Enamel made with toludine red tends to develop slight haze.

Q.3(a) Why driers are not used in Latex Paints? Give detailed composition of drier. Give accounts of basic requirement of drier. (6)

(b) Explain the chemistry of silicone additives used in surface coatings. (6)

OR

(b) Write in details about Phthalocyanine Blue & Phthalocyanine Green Pigments (6)

Q.4(a) Why Wetting & Dispersion is important in pigmented coatings? Explain in brief characteristics of W&D agent used in coatings. What is controlled Flocculation? Where does controlled flocculating additive uses? (6)

(b) What is loss of dry? Give causes for a reduction in mobility of drier due to loss of dry in details. How driers are Manufactured? Write all three manufacturing methods in detail. (6)

OR

(b) Write note on (6)
(1) Parylene & Perinone Pigment.
(2) Azo condensation Pigment.

Q.5(a) Give classification of Azo pigment. Write in details about Arylamide Yellow & Toludine Red pigment. (6)

(b) What are solvents? Explain their functions during paint manufacture & paint application. Write in details about hydrogenated solvents. (6)

OR

(b) Explain in Detail (6)
(1) Intercoat adhesion with suitable figure.
(2) Foam stabilizing & destabilizing effects with diagram

Q.6(a) Write in details about theory of solvency. Explain evaporation rate of solvent by giving suitable example. (6)

(b) Write in details (6)
(1) Tonners & Metal Tonners.
(2) Neutral mono azo pigments.

OR

(b) Various Property requirements of Organic Pigments. (6)

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SEAT No._____

[36]

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SARDAR PATEL UNIVERSITY

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

Friday, 3rd November, 2017

PS02CSCT03: Coating Properties & Analysis of Coating

Time: 10:00 am to 1:00 pm **Marks: 70**

N.B. 1) Marks allotted to the question are on its RHS

2) Illustrate your answer whereas necessary with the help of heat sketches and chemical equation

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Q.1 Choose the correct Answer from the Followings:

1. Stormer Paddle Viscometer gives viscosity in which unit? **[01]**

a) Pascal's b) Kreb

c) Stokes d) Poise

2. The yield value is observed in _____ flow **[01]**

a) Bingham b) Pseudo plastic

c) Plastic d) Thixotropic

3. Readings at _____ gloss head is related to sheen. **[01]**

a) 20° b) 85°

c) 60° d) All of the above

4. Dry film thickness depends on? **[01]**

a) Viscosity b) $\%NVV_T$

c) % NVM d) Wt/ltr

5. A paint has a wt/ltr = 1.2. What will be the weight of 5 L paint? **[01]**

a) 6.0 kg b) 5.6 kg

c) 6.2 kg d) 5.8 kg

6. Settling is not observed in _____. **[01]**

a) Varnish b) Enamel

c) Semi glossy Paint d) Primer

7. Flocculation is in context to **[01]**

a) Breaking of emulsion b) Viscosity increases

c) Poor wetting of pigment d) Gloss

8. Pick the odd one with respect to corrosion resistance test of coatings **[01]**

a) PAC b) Scratch Hardness

c) Salt Water Immersion d) Salt Spray

Q.2 Answer any seven of the Followings: **[14]**

1 How is wet film opacity checked by Pfund cryptometer?

2 A pigmented coating has coverage 20 sq mtr/lit. What is the WFT? At 50% NVV_T, What is DFT?

3 Explain 5B and 4B result in cross-cut adhesion test.

4 Give the main six causes of the coating failures.

5 Give the classification of different viscometer.

6 Write about stoving film formation in alkyd – amino system and what is the different stoving schedule?

7 Classify Gloss values according to PVC.

8 What is the relation between Dispersion and Paint properties of the paint?

9 List the surface temperature measurement instrument and explain any one.

Q.3 a. What are the different methods of film formation? Explain in brief about film formation in water based paint. **[06]**

Q.3 b. Write are the different hardness test? Write about the pendulum hardness test. **[06]**

OR

Q.3 b. What is the cause and remedy of viscosity increases and poor drying phenomenon? **[06]**

Q.4 a. Write about CIE theory of color measurement. **[06]**

Q.4 b. What is the different between flexibility & elasticity? What are the factor affecting flexibility and how it checked by conical mandrel bend tester? **[06]**

OR

Q.4 b. What is mean of formulation related coating defect and Explain any six formulation related defect. **[06]**

Q.5 a. What is the important of the gloss coating and explain different gloss head are use in coating industry. **[06]**

Q.5 b. Give the detail about solution preparation and working of salt spray test. **[06]**

OR

Q.5 b. What is the important of the Q-Fog whether meter in coating and explain it. **[06]**

Q.6 a. Explain the different defect of copper, Wood and Concrete and give cause of failure and problem prevention of that defect. **[06]**

Q.6 b. Write about following defects and give their remedies **[06]**
(1) Yellowing in white paint (2) Chalking, Checking & Cracking (3) Lifting & Blistering

OR

Q.6 b. Give the Failure Appearance, Cause of Failure and Problem Solution of Settling and Gelling **[06]**

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