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SARDAR PATEL UNIVERSITY

M.Sc. 4th Semester (Surface Coating Technology) (CBCS) Examination

Thursday, April 12th, 2018

Time: 02:00 pm to 05:00 pm

Course No.: PS04CSCT07

Subject: Corrosion Technology & Heavy Duty Protective 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:

1.1 Which of the following adsorbed layer is responsible for passivation of iron? 1

a) $Fe(OH)_2$ b) $Fe(OH)_3$ c) Fe_2O_3 d) All

1.2 Which of the following is/are required for galvanic corrosion? 1

i) Anode ii) Cathode iii) Metallic pathway iv) Electrolyte

a) only i b) only ii & iii c) only i,ii, iii d) i,ii,iii,iv

1.3 Which of the following factors can affect the corrosion? 1

a) Temperature b) pH c) Humidity d) All

1.4 one mill = _____ part of inch. 1

a) 1/100 b) 100 c) 1000 d) none

1.5 Which of the following can be used for dehumidification? 1

a) Silica gel b) Na_2SO_3 c) CO_2 d) H_2O

1.6 Which of the following type of corrosion cannot be identified by visual examination? 1

a) Pitting b) Crevice c) Galvanic d) Intergranular

1.7 Which of the following type of corrosion can be observed by microscopic evaluation? 1

a) Pitting b) Crevice c) Galvanic d) SCC

1.8 Which of the following type of corrosion main leads to perforation of vessels or pipes? 1

a) Pitting b) Crevice c) Galvanic d) SCC

Q.2 Answer the following short questions (any seven) 14

a) Define direct and indirect losses due to corrosion giving suitable example

b) List out the points to be considered to minimize corrosion.

c) Describe different types of layers formed on metal surface.

d) Describe dezincification.

e) Define immersion corrosion and how immersion test is carried out?

f) How presence of stray current can induce corrosion?

g) Describe about Freting corrosion.

h) Describe inhibitive primers.

i) Describe the use of coal-tar epoxy coatings.

Q.3 a. Describe in brief theory of corrosion and explain 6

1) Hydrogen evolution and 2) Oxygen evolution type corrosion cell

b. i) Describe the methods by which corrosive nature of environment can be reduced. 6

ii) Describe the consequences of corrosion.

OR

Q.3 a. Describe electrochemical factors that affect the corrosion rate 6

b. Classify different types of corrosion and define them. 6

Q.4 a. Write a note on galvanic corrosion. 6

b. Write a note on pitting corrosion. 6

OR

Q.4 a. Write a note on crevice and filliform corrosion. 6

b. Write a note on SCC and Fatigue corrosion. 6

Q.5 a. Describe briefly corrosion in oil industry? 6

b. i) Write a note on MIC 6

ii) Write a note on Hydrogen-Induced cracking.

OR

Q.5 a. i) What causes the corrosion in paper and pulp industries? 6

ii) How relative humidity and dew point affect the corrosion?

b. Describe different types of corrosive environment. 6

Q.6 a. Write a note on surface blasting techniques. 6

b. Write a note on anti-fouling paint. 6

OR

Q.6 a. Describe inorganic zinc primers in brief and curing mechanism of zinc silicate coatings. 6

b. i) Describe the specification required for intermediate coats. 6

ii) Describe in brief properties of epoxy, acrylic and polyurethane coatings.