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SEAT No. _____

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SARDAR PATEL UNIVERSITY

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

Wednesday, 20th March 2019

Time: 02:00 pm to 5:00 pm

Course No.: PS04CSCT22

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 is/are considered as effect of corrosion? 1
a) Reduction in metal thickness b) Contamination of fluids in pipes
c) Perforation of vessels d) All
- 1.2 Which of the following represent anodic reaction in corrosion of iron? 1
a) $\text{Fe} \rightarrow \text{Fe}^{+2} + 2\text{e}^-$ b) $\text{H}_2\text{O} + 1/2 \text{O}_2 + 2\text{e}^- \rightarrow 2\text{OH}^-$
c) $2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$ d) None
- 1.3 Which of the following is not flow induced corrosion? 1
a) Erosion b) Cavitation c) Pitting d) None
- 1.4 The corrosion due to dissimilar metals is known as _____. 1
a) Galvanic b) Pitting c) SCC 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 represents solvent borne inorganic zinc primer? 1
a) alkali silcate b) alkyl silicate c) both a & b d) None
- 1.7 Which type of corrosion will leads to reduction in mechanical strength of material? 1
a) Crevice b) Pitting c) Galvanic d) Intergranular
- 1.8 Steel substrate can corrode faster in presence of _____. 1
a) MgCl_2 b) NaCl c) Silica gel d) $\text{Na}_2\text{S}_2\text{O}_3$
- Q.2 Answer the following short questions (any seven) 14
- a) List out the necessary requirement for occurrence of galvanic corrosion.
b) What is deposition corrosion?
c) Describe Pilling Bedworth rule.
d) What is dezincification?
e) What points are to be considered to minimize the effect of corrosion?
f) How SO_x and NO_x cause atmospheric corrosion?
g) List out the pigments having anti-corrosive property.

- h) What is degraphatization?
i) Discuss corrosion fatigue.
- Q.3 a Write a note on theory of corrosion. 6
b i) Describe various aspects responsible for indirect losses due to corrosion. 6
ii) What points are to be considered to minimize the effect of corrosion?

OR

- Q.3 a Classify different types of corrosion and represent any four with the help of proper diagram. 6
b i) Write a note on polarization and passivity. 6
ii) How corrosive nature of environment can be reduced?
- Q.4 a Write a note on mechanically assisted corrosion. 6
b Write a note on Crevice and Filliform corrosion. 6

OR

- Q.4 a Write a note on hydrogen damage and hydrogen blistering. 6
b Discuss pitting corrosion and explain its different types. 6
- Q.5 a Write a note on atmospheric corrosion and describe different types of corrosive environment. 6
b Discuss following sources of corrosion in oil field industry. 6
i) Brackish water ii) Sweet corrosion iii) NAC

OR

- Q.5 a Write a note on relative humidity and dew point and explain how it affects corrosion? 6
b i) How electrochemical control can prevent corrosion? 6
ii) Discuss the sources of corrosion in paper industry.
- Q.6 a Describe various surface preparation techniques 6
b Describe the primers and classify them. 6

OR

- Q.6 a Write a note on marine coatings. 6
b Write a note on corrosion prevention technique. 6

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