

Roll No.

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238511(38)

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**Dip. in Engg. (Fifth Semester)
EXAMINATION, Dec.-Jan., 2013-14
(Metf.)**

METALLURGICAL ANALYSIS AND CORROSION

Time : Three Hours] [Maximum Marks : 100

[Minimum Pass Marks : 35

Note : Attempt any five questions. All questions carry equal marks. Draw neat sketch wherever required.

1. (a) What is the importance of metallurgical analysis of metal in an industry ? Write the chemical analysis of metal, their merits and demerits. 10
- (b) Explain the determination of carbon in steel by Strohelain apparatus. 10
2. (a) What is a corrosion ? Write the various classification of corrosion and explain the expression for corrosion rate. 6
- (b) Explain the principle and process of electro-chemical corrosion cell. 14

3. (a) Explain the reducibility of iron oxide used in direct reduced iron. Briefly describe the reactivity of coal. 10
- (b) Write the definition and importance of corrosion and briefly explain the classification of the electrochemical corrosion cell. 10
4. (a) Write the uses of coating. Describe the metallic and non-metallic coating protection method of metal against corrosion. 10
- (b) What is a polarization measurement ? Describe the rotating electrode method for corrosion current. 10
5. Write short notes on any five of the following : 4 each
 - (a) Stress corrosion cracking
 - (b) Growth of thin oxide film
 - (c) Modification of metal
 - (d) Chemical method of analysis of steel for carbon and sulphur
 - (e) Degree of metallization
 - (f) Spark method
 - (g) Corrosion fatigue
 - (h) Basic corrosion cell
6. (a) Define crevice corrosion and discuss its mechanism. 10
- (b) Write short notes on any two of the following : 5 each
 - (i) Cathodic and anodic protection

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- (ii) Hydrogen embrittlement
- (iii) Uniform and localized corrosion
- (iv) Chemical method of analysis

7. (a) State and explain Beer's and Lambert's law for absorption of light by solution. Enlist the method which is based on Beer's and Lambert's law. 10
- (b) Explain the working of double beam spectrophotometer. 10

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