17423

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3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) **Attempt any SIX of the following:** **12**

(i) Define Isobaric and Isothermal Process.

(ii) Define:

1) Adsorbent

2) Adsorbate

(iii) Define corrosion.

(iv) State Phase Rule

(v) Define Intensive and Extensive properties.

(vi) Give the classification of Engineering materials.

(vii) Define Passivity of metal.

Marks

b) **Attempt any TWO of the following:** **8**

(i) Explain dispersion method for preparation of colloidal solution.

(ii) Explain the mechanism of dry corrosion.

(iii) Explain in brief rubber lining, glass lining, lead lining and plastic lining. State their purpose.

2. Attempt any FOUR of the following: **16**

a) Explain work done in reversible isothermal expansion of gas.

b) Explain galvanic cell in brief.

c) Draw the phase diagram of a water system.

d) Differentiate physical adsorption and chemical adsorption.

e) Define ductility, plasticity, hardness, strength

f) Explain pitting and galvanic corrosion.

3. Attempt any FOUR of the following: **16**

a) Explain freundlich adsorption isotherm.

b) What is lining and give its importance.

c) State second law of thermodynamics and write its mathematical statement.

d) Explain homogeneus and heterogeneous system.

e) Draw the neat phase diagram of sulphur system.

f) Give the composition of SS-304. Write its three properties.

Marks

4. Attempt any FOUR of the following: **16**

a) Give derivation of phase rule.

b) Give the application of Teflon, polypropylene and polyvinyl chloride.

c) Define:

(i) Enthalpy

(ii) Entropy

(iii) Internal Energy

(iv) Chemical Potential.

d) Differentiate between Lyophilic and Lyophobic sols based on

(i) Defination.

(ii) Nature of substance

(iii) Viscocity

(iv) Stability

e) Explain electroplating process for prevention of corrosion.

f) Write any four purposes of lining.

5. Attempt any FOUR of the following: **16**

a) Explain any four application of adsorption.

b) Explain corrosion prevention and control method.

c) Define open system and closed system.

d) Write names of material of construction for storage.

(i) Hydrochloric Acid (HCl)

(ii) Sulphuric Acid (H_2SO_4)

(iii) Nitric Acid (HNO_3)

(iv) Caustic Soda (NaOH)

e) Give the statement of Zeroth Law of thermodynamics.

f) Derive Langmuir adsorption isotherm.

Marks

6. Attempt any FOUR of the following: **16**

a) What is caustic embrittlement?

b) Explain impressed current method of cathodic protection.

c) Explain equilibrium and Non-equilibrium states.

d) Write any four features of electro-chemical series.

e) Explain how oxide film plays an important role in atmospheric corrosion.

f) Define system, surrounding, boundary.