

17423

16117

3 Hours / 100 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) 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) Give types of colloidal solutions.
- (iii) Define corrosion.
- (iv) State phase rule.
- (v) State first law of thermodynamics.
- (vi) Give the classification of engineering materials.
- (vii) List different types of corrosion.
- b) **Attempt any TWO of the following:** **8**
- (i) Explain dispersion method for preparation of colloidal solution.
- (ii) Explain intergranular corrosion and erosion corrosion.
- (iii) What is lining and give its importance.

P.T.O.

- 2. Attempt any FOUR of the following:** **16**
- a) Derive equation for work done in isothermal expansion of ideal gas.
 - b) Explain in brief galvanic series of metals.
 - c) Give derivation of phase rule.
 - d) Give application of adsorption. (any four)
 - e) Define ductility, plasticity, hardness, strength.
 - f) Explain the mechanism of dry corrosion.
- 3. Attempt any FOUR of the following:** **16**
- a) Explain Langmuir adsorption isotherm.
 - b) Explain in brief rubber lining, glass lining lead lining and plastic lining. State their purpose.
 - c) State second law of thermodynamics and write its mathematical statement.
 - d) Define enthalpy and give expression of enthalpy.
 - e) Draw the neat phase diagram of sulphur system.
 - f) Give the composition of materials and their specific use.
 - (i) Carbon steel
 - (ii) SS 304
 - (iii) Aluminium alloys
 - (iv) Mild steel
- 4. Attempt any FOUR of the following:** **16**
- a) Draw the phase diagram of a water system.
 - b) Give the application of Teflon, Polypropylene and PVC.
 - c) Give the statement of Zeroth law of thermodynamic.
 - d) Give difference between Lyophilic solutions and Lyophobic solutions. (Any four points)

- e) Explain uniform corrosion, pitting corrosion selective corrosion.
- f) Write names of material of construction for storage of
 - (i) Hydrochloric Acid (HCl)
 - (ii) Sulphuric Acid (H_2SO_4)
 - (iii) Nitric Acid (HNO_3)
 - (iv) Caustic Soda (NaOH)

5. Attempt any FOUR of the following: 16

- a) Differentiate physical adsorption and chemical adsorption.
- b) Explain corrosion prevention and control method.
- c) Define system, surrounding, boundary. Differentiate open and closed system.
- d) Give any four properties of polyethylene.
- e) Explain Homogenous and Heterogeneous system.
- f) Explain mechanism of adsorption.

6. Attempt any FOUR of the following: 16

- a) Explain electroplating with neat sketch.
 - b) Explain effect of pH value on corrosion.
 - c) Explain Equilibrium and Non-Equilibrium states.
 - d) What is caustic embrittlement.
 - e) Draw neat labelled sketch of galvanic cell.
 - f) Define pressure, volume, work and give their expression.
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