

22233

21819

3 Hours / 70 Marks

Seat No.

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- 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) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following :

2 × 5

- (a) List out the types of crystal structure.
- (b) Define biomaterials.
- (c) Define yield stress.
- (d) Describe dielectric strength of material.
- (e) List the uses of ceramic in chemical industry.
- (f) Define polymerisation reaction.
- (g) List the types of iron.

2. Attempt any THREE of the following :

4 × 3

- (a) Discuss thermochemistry of chemical reactions.
- (b) Describe thermal stability and thermal expansion of material.
- (c) Explain chemical reactivity of iron with acid.
- (d) Write on ductility and malleability of material.
- (e) Explain the mechanism of corrosion.

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- 3. Attempt any THREE of the following :** **4 × 3**
- (a) Differentiate ceramic substances based on properties.
 - (b) Differentiate between addition and condensation polymerisation.
 - (c) Write down the factors determining the choice of material to avoid corrosion.
 - (d) Describe the classification of steel.
- 4. Attempt any THREE of the following :** **4 × 3**
- (a) Explain requirement of thermal insulation to chemical process equipment with example.
 - (b) Describe the procedure to estimate the density of any liquid.
 - (c) Calculate the heat required in Joules to raise the temperature of 100 g of water from 25 °C to 100 °C. (Take specific heat of water = 4.18 J/g °C)
 - (d) Differentiate between metal and non-metal.
- 5. Attempt any TWO of the following :** **6 × 2**
- (a) Classify the following materials as metals and non-metals :
Hydrogen, Sulphur, Selenium, Manganese, Calcium, Platinum, Gold, Silica, Polyester, Wood, Glass, Iron
 - (b) Explain different engineering properties of silicon carbide. Also discuss its uses.
 - (c) Write down any two purposes of alloy steel. Explain any one method of preparation of alloy.
- 6. Attempt any TWO of the following :** **6 × 2**
- (a) Write about the corrosion of metals by water, steam and soil in detail.
 - (b) Explain composition of stainless steel.
 - (c) Describe the effect of following elements on iron :
 - (i) Chromium
 - (ii) Nickel
 - (iii) Magnesium
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