



22233

11819

3 Hours / 70 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.*

Marks

1. Attempt the following (Solve **any 5**) : **10**
 - a) Give any two properties of biomaterial.
 - b) Define Heat capacity.
 - c) Define the Bragg's law.
 - d) Define corrosion.
 - e) Define thermal conductivity of material.
 - f) Name the types of iron.
 - g) Give the effect of any two chemical elements on iron.

2. Attempt the following (Solve **any 3**) : **12**
 - a) Explain crystal structure of NaCl.
 - b) Explain addition polymerization for polystyrene.
 - c) Explain the mechanism of corrosion in acidic medium.
 - d) List any four properties of ferrous alloys.

3. Attempt the following (Solve **any 3**) : **12**
 - a) Explain organic and inorganic insulation with examples.
 - b) Calculate the resistivity of the given material whose resistance is 2Ω , length and area of cross section are 15 cm and 25 cm^2 respectively.
 - c) List any four properties of ceramics.
 - d) Give the chemical composition for stainless steel, Tungsten steel, Nickel and Manganese steel.

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4. Attempt the following (Solve **any 3**) : **12**
- a) Explain any four mechanical properties of an Engineering material.
 - b) Explain the methods of corrosion prevention.
 - c) A 20 metre length of cable has a cross sectional area of 1 mm^2 and a resistance of 5 ohms. Calculate the conductivity of the cable.
 - d) List any four properties of thermosetting polymers.
 - e) Explain the condensation polymerization for phenyl formaldehyde.
5. Attempt the following (Solve **any 2**) : **12**
- a) Describe different thermal properties of an engineering material.
 - b) Distinguish between Thermosetting and Thermoplastic polymer.
 - c) Explain the effects of following chemical elements on iron.
 - 1) Chromium
 - 2) Nickel
 - 3) Silicon.
6. Attempt the following (Solve **any 2**) : **12**
- a) Describe the procedure to calculate the density of air.
 - b) Differentiate between addition and condensation polymerization process.
 - c) Explain the mechanism of wet corrosion in details.
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