

21415

2 Hours / 50 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.

**Marks**

**1. Attempt any NINE :**

**18**

- (a) Define :
  - (i) Flux
  - (ii) Gangue
- (b) Differentiate between pig iron and cast iron (any 2 points).
- (c) Define heat treatment of steel.
- (d) Why gold does not get corroded in air ?
- (e) Write any two advantages of metal spraying.
- (f) State the constituents of paints.
- (g) Why galvanized containers are not used to store food stuffs?
- (h) Define scales and sludges.
- (i) Explain chlorination of water by using chlorine gas.
- (j) Define sterilization and sedimentation.
- (k) List any four constituents of cement.
- (l) What is slaking of lime ?

**P.T.O.**

**2. Attempt any FOUR :****16**

- (a) Write the chemical reactions occurring during conversion of iron oxide to iron in reduction zone of blast furnace at various temperature ranges.
- (b) What is the effect of alloying elements Ni and Co on the properties of steel ?
- (c) Differentiate between annealing-normalising.
- (d) Explain stepwise the mechanism of electrochemical corrosion with evolution of hydrogen, along with neat labelled diagram.
- (e) State and explain any two factors affecting rate of atmospheric corrosion.
- (f) Differentiate between Galvanising-Tining.

**3. Attempt any FOUR :****16**

- (a) State any adverse effects of using hard water in (1) paper industry (2) sugar industry.
  - (b) Name types of impurities present in water. Explain sterilisation of water by using bleaching powder.
  - (c) Define :
    - (i) Hard water
    - (ii) Soft water
    - (iii) Degree of hardness
    - (iv) Filtration
  - (d) Draw the sketch of reverse osmosis cell and label the parts. Explain desalination of sea water by reverse osmosis.
  - (e) Explain permutit method for removal of hardness of water with diagram.
  - (f) How does setting and hardening of cement takes place ?
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