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.

1. Attempt any nine:  
   a) Name the ores of iron. Write their chemical formulae.
   b) Define the terms:
      i) Metallurgy
      ii) Slag.
   c) Write the four properties of mild steel.
   d) Define corrosion. Give its types.
   e) Write any two characteristics of ideal paint.
   f) Distinguish between galvanizing and tinning.
   g) Write two applications of electroplating.
   h) Name the types of impurities in natural water.
      i) Write two advantages and two disadvantages of Zeolite process.
      j) Draw the diagram of reverse osmosis cell for desalination of seawater.
   k) Name the constituent of Portland Cement.
   l) What is slacked lime? Give the reaction.

2. Attempt any four:  
   a) Write the chemical reaction in the zone heat absorption for extraction of iron in blast furnace.
   b) Define heat treatment properties of steel. Explain hardening.

P.T.O.
c) Give difference between pig iron, wrought iron and steel.

d) Describe the mechanism of electrochemical corrosion by absorption of oxygen.

e) Define atmospheric corrosion. Which oxide film is protective? Why?

f) State and explain metal cladding process with diagramme.

3. Attempt **any four**:

a) Explain ion exchange process of water softening with labeled diagram and write chemical reactions.

b) Write two disadvantages each of using hard water textile and dyeing industry.

c) What are bad effect of using hard water in boiler unit?

d) Write quality parameter for potable water.

e) Describe chlorination process with chemical reaction by using chlorine gas and bleaching powder. Write its advantages.

f) Define Portland Cement, write its composition. Explain the function of gypsum in cement.

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