16172

2 Hours / 50 Marks   Seat No.

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

Marks

1. Attempt **any nine** :   **(9×2=18)**

a) Name the two ores of iron. Write their chemical formulae.

b) Give the functions of coke and limestone in extraction of iron by the blast furnace.

c) Explain the terms :
   i) Mineral   ii) Flux

d) Which oxide film is most protective against corrosion ? Why ?

e) Give any two examples of corrosion due to galvanic cell action.

f) What is cementation ? Name two methods of cementation.

g) Name the different constituents of paints.

h) Name the impurities present in natural water.

i) Define sterilisation. Name different methods of sterilisation.

j) Give any four characteristics of potable water.

k) What is slaking of lime ?

l) Name the constituents of portland cement.

2. Attempt **any four** :   **(4×4=16)**

a) Write chemical reactions involved in the zone of reduction of blast furnace.

b) Explain the reactions taking place during hardening and settling of cement.

c) Describe the mechanism of immersed corrosion with evolution of hydrogen gas.

P.T.O.

   d) State and explain metal cladding process with diagram.

   e) Discuss the bad effect of using hard water in following industries :

     i) paper   ii) sugar

   f) Describe in brief the zeolite process for softening of hard water.

3. Attempt **any four** :   **(4×4=16)**

   a) Explain open hearth process for manufacturing of steel.

   b) Define heat treatment. Write the purposes of heat treatment.

   c) Distinguish between Galvanizing and Tinning.

   d) Explain the ill effects of using hard water in boilers.

   e) 50 ml of sample of water was titrated with 0.01M EDTA and following observations were reported.

     i) Total hardness, burette reading = 25 ml

     ii) Permanent hardness, burette reading = 10 ml.

   Find the temporary hardness of the same. [1ml of 0.01M EDTA = 1 mg of $CaCO_3$].

   f) Explain ion exchange process of water softening with labelled diagram and write chemical reactions.

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