11718

2 Hours / 50 Marks   Seat No.

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 nine** of the following :   **18**

   a) Name any two ores of iron with their chemical formulae.

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

   c) Give any four properties of high carbon steels.

   d) Define atmospheric corrosion.

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

   f) Name two constituents of paint and one function of each.

   g) Why galvanised containers are not used for storing food stuff ?

   h) Name four impurities present in natural water.

   i) Define sterilization.

   j) How can the exhausted permutile be regenerated ?

   k) What is function of silica and ironoxide in cement ?

   l) What is plaster of paris ?

2. Attempt **any four** of the following :   **16**

   a) Distinguish between cast iron, wrought iron and steel (any **4** points).

   b) With neat and labeled diagram, describe open hearth process for preparation of steel.

   c) Explain the process of Normalising of steel.

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   d) Explain sherardising process with suitable diagram.

   e) State and explain any four factors affecting rate of electrochemical corrosion.

   f) Describe the sacrificial anodic protection method with the help of diagram. Write its applications.

3. Attempt **any four** of the following :   **16**

   a) What are boiler scales ? Explain the causes of the formation of boiler scales.

   b) Write two disadvantages each of using hardwater in paper and sugar industry.

   c) Calculate carbonate and non-carbonate hardness of a sample of water containing $MgCl_2$ = 9.5 PPM, $MgSO_4$ = 48 PPM, Ca $(HCO_3)_2$ = 16.2 PPM, KCl = 12 PPM, Mg $(HCO_3)_2$ = 14.6 PPM.

   d) Describe ion exchange process of softening of hardwater with neat and labeled diagram and chemical reactions.

   e) Describe chlorination process with – Chemical reactions by using chlorine gas. Write it's two disadvantages.

   f) Describe setting and hardening of cement. Write chemical reactions taking place.

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