

Sample Test Paper-I

Course Name : Civil Engineering Group

Course Code : CE/ CR/CS/CV

Semester : Second

Subject Title : Applied Science (Chemistry)

Marks : 25

17208

Time: 1 Hour

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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.
5. Preferably, write the answers in sequential order.

**Q.1) Attempt any FOUR of the following.**

**08 Marks**

- a. Define metallurgy and ore.
- b. Name raw materials fed to blast furnace for extracting iron.
- c. Why steel is tempered after hardening process?
- d. Define corrosion. Name the types of corrosion.
- e. Why metals corrode faster in humid atmosphere?
- f. How metals can be protected by modifying their properties?

**Q.2) Attempt any THREE of the following.**

**09 Marks**

- a. How steels are classified on the basis of percentage of carbon?
- b. Name the products of blast furnace. Write one use of each.
- c. Write three properties each of cast iron and wrought iron.
- d. Describe three factors affecting rate of immersed corrosion.
- e. Describe the method used for protecting large irregular surfaces from corrosion.

**Q.3) Attempt any TWO of the following.**

**08 Marks**

- a. Write the chemical reactions taking place in the zone of heat absorption in blast furnace.
- b. Distinguish between galvanizing and tinning.
- c. Describe with the help of figure, mechanism of electrochemical corrosion by forming galvanic cell.

Sample Test Paper-II

Course Name : Civil Engineering Group

Course Code : CE/ CR/CS/CV

Semester : Second

Subject Title : Applied Science (Chemistry)

Marks : 25

17208

Time:1 Hour

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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.
5. Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR of the following.**

**08 Marks**

- a. Define temporary hardness and permanent hardness of water.
- b. Write multiplication factor to convert  $MgCl_2$  and  $Ca(HCO_3)_2$  into  $CaCO_3$  equivalents.
- c. Name two commonly used coagulants with chemical formulae.
- d. State four quality parameters for potable water.
- e. How is slaked lime prepared?
- f. What is the function of gypsum in cement?

**Q.2 Attempt any THREE of the following.**

**09 Marks**

- a. Write chemical reactions of three hardness causing salts with soap.
- b. Define sterilization. Write chemical reactions in chlorination by using chlorine gas.
- c. State disadvantages of using hard water for cooking, bathing and drinking.
- d. Define deionization. How are the exhausted resins regenerated?
- e. Write average compound composition of portland cement.

**Q.3 Attempt any TWO of the following.**

**08 Marks**

- a. How hardness of water is determined by EDTA method?
- b. Describe the four disadvantages of scale formation in boiler.
- c. Write two properties and two applications of water proofing cement and super sulphate cement.

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Sample Question Paper

Course Name : Civil Engineering Group

Course Code : CE/ CR/CS/CV

Semester : Second

Subject Title : Applied Science (Chemistry)

Marks : 50

17208

Time:2 Hour

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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.
5. Preferably, write the answers in sequential order.

**Q.1) Attempt any NINE**

**18 Marks**

- a) Name two ores of with their chemical formulae.
- b) Write chemical reaction for formation of slag in blast furnace.
- c) Name four properties of high carbon steels.
- d) Name two types of metal oxide films formed due to corrosion with one example each.
- e) State two constituents of paint and one function of each.
- f) Write two applications of metal cladding process.
- g) Distinguish between galvanizing and sherardizing.
- h) Write two causes of formation of boiler scales.
- i) Sketch the reverse osmosis cell for desalination of sea water.
- j) Write two advantages and two disadvantages of permutit process.
- k) Write two properties of plaster of paris.
- l) State two types of lime with percentage of CaO in them.

**Q2. Attempt any FOUR**

**16 Marks**

- a) Write the chemical reactions in the zone of reduction for extraction of iron in blast furnace.
- b) With neat and labeled diagram, describe open hearth process for preparation of steel.
- c) Describe the heat treatment which increases the cutting ability of steel.
- d) Describe mechanism of electrochemical corrosion by evolution of hydrogen gas.
- e) What is atmospheric corrosion. Describe two factors affecting rate of it.
- f) Describe the sacrificial anodic protection method with help of figure. Write its applications.

**Q3. Attempt any FOUR**

**16 Marks**

- a) Name two types of impurities in natural water. Write two examples of each. Suggest one method for removal of each.
- b) Write two disadvantages each of using hard water in paper industry and sugar industry.
- c) On water analysis it is found that, 100ml of water sample requires 25 ml of 0.01 M EDTA using  $\text{NH}_4\text{Cl-NH}_4\text{OH}$  buffer and EBT indicator. Calculate hardness of water sample in ppm.
- d) Describe ion-exchange process of water softening with neat and labeled diagram and chemical reactions.
- e) Describe chlorination process with chemical reactions by using chloramine. Write its two advantages.
- f) Describe setting and hardening of cement. Write chemical reactions taking place.

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