

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B.Tech., Winter 2017 - 18 Examination**

**Semester: 1/2**  
**Subject Code: 03103101**  
**Subject Name: Chemistry**

**Date: 11/01/2018**  
**Time: 2:00 pm to 4:30 pm**  
**Total Marks: 60**

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1 Objective Type Questions.****(15)**

1. Complete the following equations: 1ppm=.....mg/litre.....°French.....°Clark
2.  $\text{Ca}(\text{HCO}_3)_2$   $\xrightarrow{\text{on heating}}$  .....
3. CNG is..... and its main constituent is .....
4. ....variety of coal is used in Metallurgy.
5. Alumina, Silica and Fireclay are..... refractories.
6. Name one neutral refractory and its chemical composition.
7. Name two Natural abrasives.
8. What is the chemical formula of Rust?
9. What is Galvanizing?
10. Name units of Heat.
11. Coke and Charcoal are examples of .....fuels.
12. Define Biofuel.
13. Which element is present in all organic compounds:  
 (a) Carbon      (b) Nitrogen      (c) Oxygen      (d) Phosphorus
14. Catenation is a property of the carbon atom which describes its ability to:  
 (a) bond with other Carbon atoms      (b) form double and triple bond  
 (c) exist in plant and animal form      (d) form bonds in its ground state.
15. In an Electrochemical cell Oxidation occurs at ..... and Reduction occurs at .....

**Q.2 Answer the following questions. (Attempt any three)****(15)**

- A) Define Corrosion of metals. What are different types of Corrosion? Explain the electrochemical theory of wet corrosion, giving its mechanism.
- B) Distinguish between hard water and soft water. What is Break point chlorination?
- C) Define and classify fuels. Describe the Proximate analysis of coal and discuss its significance.
- D) Write in brief, applications of biotechnology.

**Q.3 A) Explain various methods used to prevent corrosion of metals.****(07)**

B) (i) Distinguish between Metallic conduction and Electrolytic conduction.

**(04)**

(ii) What are Insulating materials? What are the characteristics needed for an insulator?

**(04)****OR**

B) (i) What are Refractories ? How are they classified? Give the essential requirements of good Refractories?

**(04)**

(ii) What are Primary and Secondary cells? Discuss one example of each.

**(04)****Q.4 A) (i) Discuss, in brief, the boiler corrosion. How is it controlled?****(04)**

(ii) Name the various fractions obtained during the fractional distillation of crude oil.

**(03)****OR**

A) (i) Differentiate between Scale and Sludge. Discuss methods used for their prevention.

**(04)**

(ii) Explain Caustic embrittlement in boiler and how can it be avoided?

**(03)**

B) (i) What is Nernst equation for an electrode and cell reaction? Write mathematical expression for it.

**(05)**

(ii) Write a note on Standard Hydrogen Electrode.

**(03)**