Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–I & II (NEW) EXAMINATION – WINTER 2015**

**Subject Code: 2110001** **Date:22/12/2015**

**Subject Name: Chemistry**

**Time: 10:30am to 01:00pm** **Total Marks: 70**

**Instructions:**

1. **Question No. 1 is compulsory. Attempt any four out of remaining Six questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

| Q.1 | Objective Question (MCQ) | Mark | Attribute |
|---|---|---|---|
| (a) | | 07 | |
| 1. | Hardness of water is expressed in equivalents of….. (A) $MgCO_3$ (B) $CaCO_3$ (C) $BaSO_4$ (D) $MgSO_4$ | | (R/U) |
| 2. | Temporary hardness of water is caused by the presence of (A) Chlorides of calcium and magnesium (B) Sulfates of calcium and magnesium (C) Bicarbonates of calcium and magnesium (D) Carbonates of calcium and magnesium | | (R/U) |
| 3. | Free radical polymerization mechanism requires (A) Catalyst (B) Initiator (C) Fillers (D) Sulphur | | (R/U) |
| 4. | Example of addition polymer is (A) Polystyrene (B) Polyethene (C) Poly vinyl chloride (D) All | | (R/U) |
| 5. | Chemical formula of Rust is…. (A) $Fe_2O_3$ (B) FeO (C) $Fe_2O_3 \cdot XH_2O$ (D) $Fe_2O_3$ | | (R/U) |
| 6. | Ratio of volumes of metal oxides to metal is known as, (A) Specific mass ratio (B) Volume ratio (C) Specific ratio (D) Specific volume ratio | | (R/U) |
| 7. | Which metal is not employed as Sacrificial anode? (A) Mg (B) Zn (C) Al (D) Na | | (R/U) |
| (b) | | 07 | |
| 1. | Thermosetting polymers are (A) Cross linked (B) Heat resistant (C) Non-recyclable (D) All | | (R/U) |
| 2. | Corrosion is a process reverse of _____ of metal. (A) Destruction (B) Extraction (C) Rusting (D) Galvanizing | | (R/U) |
| 3. | When temporary hard water is boiled, one of the substance formed is (A) $CaCO_3$ (B) $CaSO_4$ (C) HCl (D) $CO_2$ | | (R/U) |
| 4. | Type of bond in $NH_3$ | | (R/U) |

(A) Covalent (B) Ionic (C) Both A&B (D) None of these

**(R/U)**

**5.** Natural rubber is…
(A) Polychloroprene (B) Cis-Polyisoprene
(C) Polyneoprene (D)Trans-Polyisoprene

**6.** Electrochemical corrosion takes place on, **(R/U)**
(A) Anodic area (B) Cathodic area
(C) Near cathode (D) Near anode

**7.** In Proximate analysis of coal the % of which is determined… **(R/U)**
(A) Nitrogen (B) Sulphur (C) Carbon (D) Fixed carbon

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|---|---|---|---|---|
| **Q.2** | **(a)** | What is biotechnology? Discuss its importance in agriculture. | **03** | **(R/U/A)** |
| | **(b)** | Give the classification of refractory. Explain its characteristics. | **04** | **(U/A)** |
| | **(c)** | Write short note on: Fermentation process. | **07** | **(U/A)** |
| **Q.3** | **(a)** | Discuss the setting and hardening of cement. | **03** | **(R/U/A)** |
| | **(b)** | What is polymerization? Give synthesis of nylon. | **04** | **(U/A)** |
| | **(c)** | Write short note on: Fractional distillation of petroleum. | **07** | **(U/A)** |
| **Q.4** | **(a)** | Explain Biodegradable polymer with examples. | **03** | **(R/U/A)** |
| | **(b)** | Give difference between dry and wet process of cement manufacture. | **04** | **(U/A)** |
| | **(c)** | Describe the manufacture of Portland cement by rotary kiln technology. | **07** | **(U/A)** |
| **Q.5** | **(a)** | What is pilling bed worth rule? | **03** | **(R/U/A)** |
| | **(b)** | Explain theory and mechanism of wet corrosion. | **04** | **(U/A)** |
| | **(c)** | Write short note on corrosion control. | **07** | **(U/A)** |
| **Q.6** | **(a)** | Give classification of alloys and its important application. | **03** | **(R/U/A)** |
| | **(b)** | Explain break point chlorination. | **04** | **(U/A)** |
| | **(c)** | What is desalination of brackish water? Discuss any one method of desalination. | **07** | **(U/A)** |
| **Q.7** | **(a)** | What are the disadvantages of using hard water in boiler operations? | **03** | **(R/U/A)** |
| | **(b)** | Calculate the weight and volume of air required for the combustion of 0.5kg of carbon. | **04** | **(U/A)** |
| | **(c)** | What are fibers? Give classification and application of liquid crystals. | **07** | **(U/A)** |

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