

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-I & II EXAMINATION – WINTER 2025

Subject Code:3110001

Date:06-01-2026

Subject Name:Chemistry

Time:02:30 PM TO 05:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

Marks

- Q.1** (a) Write characteristics of good fuel. **03**
- (b) Why Vulcanized rubber is more stable and stronger compared to natural rubber? **04**
- (c) Explain the suitable method to analyze the percentage of moisture, volatile matter and ash content in a coal sample. **07**
- Q.2** (a) What do you understand by temporary and permanent hardness of water? **03**
- (b) Give the reaction for synthesis and uses of polymer nylon-6,6 and PVC. **04**
- (c) What is corrosion? Explain electrochemical corrosion in detail. **07**
- OR**
- (c) What are alloys? Why alloys are better than pure metal for making of various tools? Justify your answer with the help of examples. **07**
- Q.3** (a) Define Electron negativity, Ionization enthalpy and Electron affinity. **03**
- (b) Give labeled schematic diagram for refining of petroleum by fractional distillation. **04**
- (c) Define chemical bond. Explain various types of Bonds with suitable example. **07**
- OR**
- Q.3** (a) Distinguish between scale and sludge. **03**
- (b) Explain Top down and Bottom up approaches for the synthesis of nanomaterial. **04**
- (c) What is nanomaterial? Write applications of nanomaterial in textile industries, catalysis and medicine. **07**
- Q.4** (a) Write a specific applications of following polymers- **03**
a. Polyvinyl styrene b. Bakelite c. High density polyethene
- (b) Discuss any two boiler Problems in detail. **04**

(c) Explain the fermentation processes for preparation of Alcohol. **07**

OR

Q.4 (a) What are fullerenes? Write properties of fullerenes in short. **03**

(b) What is pH? Draw a graph of pH metric titration of strong acid Vs. strong base and justify it. **04**

(c) Explain Zeolite method for the softening of water with neat and clean diagram. **07**

Q.5 (a) What are enzymes? Write four characteristics of enzymes. **03**

(b) Explain Electro dialysis method for desalination of brackish water. **04**

(c) Draw a schematic diagram of UV spectrophotometer. Write principle and applications of UV-Visible Spectroscopy. **07**

OR

Q.5 (a) Explain the terms : Octane and Cetane numbers **03**

(b) Give any two methods of removal of micro organisms from water. **04**

(c) Draw a schematic diagram of IR spectrophotometer. Write principle and applications of IR Spectroscopy. **07**
