

Seat No./Enrollment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 6 – EXAMINATION – SUMMER 2026

Subject Code: 3160510

Date: 29/05/2026

Subject Name: Petroleum Refining and Petrochemicals

Time: 10:30 AM TO 01:00 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.**

- Q.1**
- (a) Compare furfural and phenol extraction treatments. **03**
 - (b) Explain various types of physical and chemical impurities of petroleum fractions. **04**
 - (c) Discuss the Indian refining scenario in detail. **07**
- Q.2**
- (a) Enlist and explain various types of gases. **03**
 - (b) Explain pumping of waxy crude oil in detail. Also comment on heating of crude oil. **04**
 - (c) Classify crude oil based on various parameters. **07**
- OR
- Q.2**
- (c) Explain crude assay for crude oil in detail. **07**
- Q.3**
- (a) Distinguish between thermal and catalytic cracking. Also brief about the mechanism of thermal cracking. **03**
 - (b) Define flash and fire point and list down methods for determination of the same. Also explain any one method in brief. **04**
 - (c) Discuss fluidized catalytic cracking (FCC) unit of refinery and also elaborate on the reactor and regenerator of this unit. **07**
- OR
- Q.3**
- (a) Distinguish between alkylation, isomerization and polymerization units. **03**
 - (b) Define softening point and penetration index and explain determination of softening point. **04**
 - (c) Highlight the need for a reformer unit in the refinery. Also explain this unit with a neat sketch. **07**
- Q.4**
- (a) Compare LDPE, HDPE and LLDPE. **03**
 - (b) Explain the need of pretreatment of crude oil in detail and discuss any one method in detail. **04**
 - (c) Discuss manufacturing of styrene with a neat sketch. **07**
- OR
- Q.4**
- (a) Compare SBR with PBR in detail. **03**
 - (b) Explain the Lead Doctor process with a neat sketch. **04**
 - (c) Explain manufacturing of methanol in detail with a neat sketch. **07**
- Q.5**
- (a) Enlist applications of PVC in various fields. **03**

(b) Explain the major problems associated with Vinyl Chloride production. **04**

(c) Explain various sources of aromatics and discuss aromatic separation in detail. **07**

OR

Q.5 **(a)** Explain major applications of polypropylene. **03**

(b) Explain the primary engineering problems encountered during formaldehyde production. **04**

(c) Explain synthesis of LDPE in detail. **07**
