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**

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Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code:3160510 Date:28-05-2025

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.**

			MARKS
Q.1	**(a)**	Enlist important properties & applications of naphtha.	**03**
	(b)	Give an account of crude oil refining scenario in global context.	**04**
	(c)	Categorize different crude oils based on their characteristics.	**07**
Q.2	**(a)**	Discuss the challenges of pumping waxy crude and how to overcome them.	**03**
	(b)	Explain ASTM distillation with a neat sketch.	**04**
	(c)	What are the needs of additives for gasoline fuels? Describe any two.	**07**
		OR	
	(c)	Specify two most important tests for bitumen in detail.	**07**
Q.3	**(a)**	List the important tests and properties of kerosene.	**03**
	(b)	Write a short note on Merox Sweetening.	**04**
	(c)	Discuss production of LPG and any one treatment of LPG in detail.	**07**
		OR	
Q.3	**(a)**	List the physical impurities found in crude oil and the related problems.	**03**
	(b)	What is dewaxing of lubes and its significance? Explain any one method for dewaxing of lubes.	**04**
	(c)	With the help of a neat flow sheet describe the process of BTX separation.	**07**
Q.4	**(a)**	Discuss about VDU for the crude petroleum.	**03**
	(b)	Define Following: (i) Smoke point (ii) Pour point (iii) Octane number (iv) Diesel index	**04**
	(c)	Define thermal cracking of crude petroleum and explain Dubb`s two coil process of thermal cracking in detail.	**07**
		OR	
Q.4	**(a)**	List out various types of gases from petroleum and explain about any one.	**03**
	(b)	Write a short note on platforming catalyst.	**04**
	(c)	Explain Fluid catalytic cracking (FCC) in detail with a neat diagram.	**07**
Q.5	**(a)**	List the major industrial application of chloromethane.	**03**
	(b)	Discuss the engineering problems associated with methanol production.	**04**
	(c)	Explain the manufacturing process of Ethylene dichloride with a flow sheet.	**07**
		OR	
Q.5	**(a)**	List the important properties and uses of formaldehyde.	**03**
	(b)	Discuss the major engineering problems involved in the manufacturing of Vinyl chloride monomer.	**04**
	(c)	Explain manufacturing process of LDPE with a flow sheet along with its industrial application.	**07**

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Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3160510 Date:22-05-2024

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.**

			MARKS
Q.1	**(a)**	Define any two properties employed for Gasoline and its significance.	**03**
	(b)	Discuss classification of crude oil in brief.	**04**
	(c)	Discuss the recent scenario of production of crude oil and refineries in India.	**07**
Q.2	**(a)**	Discuss briefly; Aniline point and Diesel Index.	**03**
	(b)	Discuss in brief Atmospheric Distillation Unit.	**04**
	(c)	Discuss any three tests for testing of kerosene in detail.	**07**
		OR	
	(c)	Discuss about different types of additives added in gasoline and their functions.	**07**
Q.3	**(a)**	Explain in brief: Cetane Number and its significance.	**03**
	(b)	Write short note on Electric desalting process.	**04**
	(c)	Discuss with neat diagram Fluid catalytic cracking in detail..	**07**
		OR	
Q.3	**(a)**	Draw neat sketch of ASTM distillation apparatus	**03**
	(b)	Mention the different tests recommended for diesel fuels? Discuss any two.	**04**
	(c)	Discuss in detail about catalytic reforming with neat sketch.	**07**
Q.4	**(a)**	Explain briefly delayed coking.	**03**
	(b)	Discuss in brief about Merox sweetening process for gasoline.	**04**
	(c)	Discuss manufacturing process of Methanol with neat sketch.	**07**
		OR	
Q.4	**(a)**	Discuss properties of LPG.	**03**
	(b)	Discuss major engineering problems involved in production of PVC.	**04**
	(c)	With the help of a detailed flow diagram explain the manufacturing process of Ethylene.	**07**
Q.5	**(a)**	Discuss cloud point and pour point test.	**03**
	(b)	Explain the major engineering problems involved in the manufacturing of Methanol.	**04**

	(c)	Discuss manufacturing process of HDPE with neat sketch along with its application.	**07**

OR

Q.5	**(a)**	Discuss properties and applications of Polypropylene.	**03**
	(b)	Explain True boiling point test with neat sketch.	**04**
	(c)	Discuss with neat flow diagram the manufacturing process of Ethylene dichloride.	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2023

Subject Code:3160510 Date:12-07-2023

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.**

			MARKS
Q.1	**(a)**	Discuss composition of crude oil.	**03**
	(b)	How crude oil is classified? Discuss.	**04**
	(c)	Discuss the recent scenario of production of crude oil and refineries in India.	**07**
Q.2	**(a)**	Discuss Visbreaking in brief.	**03**
	(b)	Discuss in brief Vacuum Distillation Unit.	**04**
	(c)	Discuss any three tests for testing of gasoline in detail.	**07**
		OR	
	(c)	State different types of additives added in gasoline and their functions.	**07**
Q.3	**(a)**	Explain in brief: Octane Number and knocking.	**03**
	(b)	Write short note on Electric desalting process.	**04**
	(c)	Explain catalytic reforming in terms of reaction, catalyst, feed stock, operating condition, end products and effect of operating variables.	**07**
		OR	
Q.3	**(a)**	Write in brief; Properties and applications of SBR	**03**
	(b)	What are the different tests recommended for diesel fuels? Explain any two.	**04**
	(c)	Discuss with neat diagram Fluid catalytic cracking in detail.	**07**
Q.4	**(a)**	Draw detailed diagram of Platforming process.	**03**
	(b)	Differentiate between Merox sweetening process and Lead doctoring process for gasoline.	**04**
	(c)	Discuss manufacturing process of LPG with neat sketch.	**07**
		OR	
Q.4	**(a)**	How deasphalting process is carried out for Lubricating oil? Explain in brief.	**03**
	(b)	Discuss major engineering problems involved in production of Methanol.	**04**
	(c)	With the help of a detailed flow diagram explain the manufacturing process of Ethylene	**07**
Q.5	**(a)**	Discuss softening point and penetration index with respect to Bitumen;	**03**
	(b)	Explain the major engineering problems involved in the manufacturing of Vinyl chloride monomer.	**04**
	(c)	Discuss manufacturing process of LDPE with neat sketch along with its application	**07**
		OR	
Q.5	**(a)**	Discuss properties and applications of Ethylene dichloride.	**03**
	(b)	Explain ASTM distillation with neat sketch.	**04**
	(c)	Discuss with neat flow diagram explain the manufacturing process of Polypropylene	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022

Subject Code:3160510 Date:08/06/2022

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.**

			MARKS
Q.1	**(a)**	Write a short note on oil fields and refineries in India.	**03**
	(b)	State and explain evidences in favor of biogenic origin crude oil of crude oil.	**04**
	(c)	Describe any two important properties employed for Gasoline.	**07**
Q.2	**(a)**	Explain any three types of gases in detail.	**03**
	(b)	Explain and discuss about the additives for gasoline	**04**
	(c)	Discuss about different tests and properties of kerosene in brief.	**07**
		OR	
	(c)	Describe any two important properties employed for Diesel in detail.	**07**
Q.3	**(a)**	Discuss electric desalting process in brief.	**03**
	(b)	Write a short note on Atmospheric Distillation Unit.	**04**
	(c)	Describe different arrangement of distillation tower in petroleum fractioning with the help of neat sketches.	**07**
		OR	
Q.3	**(a)**	Discuss the process of Lead doctoring of gasoline.	**03**
	(b)	Write manufacturing process of LPG with flow sheet.	**04**
	(c)	Explain Merox sweetening process for gasoline treatment.	**07**
Q.4	**(a)**	Discuss about various catalysts used in catalytic cracking.	**03**
	(b)	Differentiate between moving bed crackers and fluidized bed crackers.	**04**
	(c)	Explain catalytic reforming in terms of reaction, catalyst, feed stock, operating condition, end products and effect of operating variables.	**07**
		OR	
Q.4	**(a)**	Explain reforming process for crude processing.	**03**
	(b)	Describe plat forming in detail with a neat diagram.	**04**
	(c)	What is delayed coking? Describe the delayed coking operation with diagram.	**07**
Q.5	**(a)**	Discuss major engineering problems involved in production of Methanol.	**03**
	(b)	Discuss major engineering problems involved in production of ethylene.	**04**
	(c)	With the help of a detailed flow sheet explain the manufacturing process of polypropylene.	**07**

OR

Q.5	**(a)**	Explain the major engineering problems involved in the manufacturing of Vinyl chloride monomer	**03**
	(b)	Describe manufacturing process of LDPE in detail along with its application.	**04**
	(c)	Describe manufacturing process of HDPE in detail along with its application. and also explain difference between HDPE and LDPE.	**07**

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