Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VI EXAMINATION – WINTER 2025

Subject Code: 3160510 Date: 21-11-2025

Subject Name: Petroleum Refining and Petrochemicals

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)**	Discuss the composition of crude oil..	**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; Flash point and Fire point.	**03**
	(b)	Discuss in brief Vacuum Distillation Unit.	**04**
	(c)	Discuss any three tests for testing of gasoline in detail.	**07**
		OR	
	(c)	Discuss about different types of additives added in gasoline and their functions.	**07**
Q.3	**(a)**	Explain in brief: Cloud and Pour Point.	**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)**	Explain ASTM distillation process.	**03**
	(b)	Discuss any two tests recommended for kerosene.	**04**
	(c)	Discuss in detail about Plat forming with neat sketch.	**07**
Q.4	**(a)**	Explain briefly Visbreaking.	**03**
	(b)	Discuss in brief about Lead Doctor sweetening process for gasoline.	**04**
	(c)	Discuss manufacturing process of Ethylene with neat sketch.	**07**
		OR	

Q.4	**(a)**	Discuss properties of Formaldehyde.	**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 Styrene.	**07**
Q.5	**(a)**	Discuss Octane number and its significance.	**03**
	(b)	Explain the major engineering problems involved in the Manufacturing of Methanol.	**04**
	(c)	Discuss manufacturing process of LDPE 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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Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3160510 Date:02-12-2024

Subject Name:Petroleum Refining and Petrochemicals

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)**	Define: Flash point, Pour point, Smoke point	**03**
	(b)	Brief about Indian refining scenario and oil reservoirs in India.	**04**
	(c)	Enlist various tests for gasoline and explain all in detail.	**07**
Q.2	**(a)**	List various sweetening processes and brief the adverse effects of impurities present in the petroleum product.	**03**
	(b)	Explain electric desalter with neat sketch.	**04**
	(c)	Classify crude oil based on various properties.	**07**
		OR	
	(c)	Explain the role and need of additives of gasoline. Discuss each type of additive in detail.	**07**
Q.3	**(a)**	Explain ASTM distillation test for gasoline.	**03**
	(b)	Explain the biogenic theory for formation of crude oil in detail.	**04**
	(c)	Explain isomerization and polymerization units of refinery.	**07**
		OR	
Q.3	**(a)**	Explain Ball and Ring test for bitumen.	**03**
	(b)	Briefly explain catalytic alkylation.	**04**
	(c)	Explain about delayed coker unit in detail.	**07**
Q.4	**(a)**	Compare thermal and catalytic cracking.	**03**
	(b)	Explain lead Doctor process in detail. Also explain its reactions,	**04**
	(c)	Explain FCC with neat sketch.	**07**
		OR	
Q.4	**(a)**	Explain pumping of waxy crude oil.	**03**
	(b)	Compare phenol extraction and furfural extraction.	**04**
	(c)	Explain need of reforming unit and explain with neat sketch. Also write on regeneration of catalyst in reformer unit.	**07**
Q.5	**(a)**	Enlist various routes for methanol synthesis.	**03**
	(b)	Discuss various applications of SBR and Methanol.	**04**
	(c)	Discuss formaldehyde production with neat sketch.	**07**
		OR	
Q.5	**(a)**	List various C1, C2 based and aromatic petrochemicals.	**03**
	(b)	Explain BTX separation in brief.	**04**
	(c)	Explain LDPE production with neat sketch and differentiate between HDPE and LDPE.	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3160510 Date:11-12-2023

Subject Name:Petroleum Refining and Petrochemicals

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)**	Give classification of crude oil.	**03**
	(b)	Discuss about ADU for the crude petroleum.	**04**
	(c)	Describe different arrangement of distillation towers in petroleum fractioning with the help of neat sketches.	**07**
Q.2	**(a)**	Define: (i) Octane number (ii) Cetane number (iii) Softening point	**03**
	(b)	Explain lead doctoring method for treatment of gasoline in brief.	**04**
	(c)	Explain (FCC) fluidized catalytic cracking with neat sketch.	**07**
		OR	
	(c)	Explain the catalytic reforming process in detail.	**07**
Q.3	**(a)**	State various routes of production of methanol.	**03**
	(b)	Discuss major engineering problems of methanol.	**04**
	(c)	Explain Merox sweetening process for gasoline treatment.	**07**
		OR	
Q.3	**(a)**	Discuss major engineering problems, properties and uses of acetic acid.	**03**
	(b)	Write down various properties and uses of Poly Vinyl Chloride (PVC).	**04**
	(c)	Describe manufacturing process of LDPE with neat process flow diagram.	**07**
Q.4	**(a)**	Write explanatory note on visbreaking.	**03**
	(b)	Discuss industrial uses of polypropylene.	**04**
	(c)	Discuss manufacturing process of styrene with neat flow diagram.	**07**
		OR	
Q.4	**(a)**	Enlist major engineering problems associated with production of ethylene oxide.	**03**
	(b)	What is dewaxing? Why it is required? Explain any one method for dewaxing of lubes.	**04**
	(c)	Discuss various types of naphtha and their important properties & applications.	**07**
Q.5	**(a)**	List the various types of gases from petroleum.	**03**
	(b)	Write down various properties and uses of formaldehyde.	**04**
	(c)	Discuss about different test and properties of petroleum oil.	**07**
		OR	
Q.5	**(a)**	Enlist major petrochemical units in India.	**03**
	(b)	Discuss in brief: Role of crude oil in global economy.	**04**
	(c)	Discuss about the current scenario of world petrochemical industry.	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3160510 Date:16-12-2022

Subject Name:Petroleum Refining and Petrochemicals

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.**

Q.1	**(a)**	Differentiate: Atmospheric Distillation Unit (ADU) and Vacuum Distillation Unit (VDU) for crude petroleum	**03**
	(b)	Explain in brief: Necessity and types of Cracking	**04**
	(c)	Explain in detail with a neat flow diagram: Manufacturing process of Butadiene	**07**
Q.2	**(a)**	Define sweetening of gas. Enlist various sweetening techniques for gases.	**03**
	(b)	Enlist important properties & tests for gasoline and explain any one in brief.	**04**
	(c)	Explain in detail with a neat flow diagram: Manufacturing process of Methanol	**07**
		OR	
	(c)	Explain in detail with a neat flow diagram: Manufacturing process of Ethylene Glycol	**07**
Q.3	**(a)**	Explain in brief: Visbreaking technique for crude petroleum	**03**
	(b)	Discuss in brief: Pumping of waxy crude	**04**
	(c)	Explain in detail: Composition of crude oil	**07**
		OR	
Q.3	**(a)**	Explain in brief: Hydrocracking technique for crude petroleum	**03**
	(b)	Discuss major engineering problems associated with the manufacturing process of Ethylene in brief.	**04**
	(c)	Enlist various pipe still heaters used for heating crude petroleum. Explain any two in brief.	**07**
Q.4	**(a)**	Enlist various properties and uses of Chloromethane.	**03**
	(b)	Define Following: (i) Smoke point (ii) Pour point (iii) Cetane number (iv) Softening point	**04**
	(c)	Define cracking of crude petroleum. Explain Dubb`s two coil process of thermal cracking in detail.	**07**
		OR	
Q.4	**(a)**	Explain in brief: LPG and its various composition	**03**
	(b)	Explain in brief: Conradson carbon residue method for lube oil	**04**
	(c)	Explain in detail with a neat flow diagram: Manufacturing process of Polypropylene	**07**
Q.5	**(a)**	Explain in brief: Role of crude oil in Global economy	**03**
	(b)	Explain the Fluid Catalytic Cracking process in brief.	**04**
	(c)	Enlist various treatment techniques of gasoline. Explain Lead Doctoring treatment technique for gasoline in detail.	**07**
		OR	
Q.5	**(a)**	Explain in brief: BTX separation	**03**

(b) Explain Penetration index test for Bitumen in brief. **04**

(c) Enlist various treatment methods of lube oil. Explain Phenol extraction method in detail. **07**

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