RGPV (DIPLOMA WING) BHOPAL

OBE CURRICULUM FOR THE COURSE

FORMAT - 3

Sheet No.

Branch CHEMICAL Semester 5

Course Code Course Name PETROLEUM REFINARY

Course	Describe origin, formation and composition of petroleum	Teach	Marks		
Outcome 1		Hrs			
Learning	Student will be able to explain origin and formation	06	08		
Outcome 1	of Petroleum for Industry.				
Contents	Introduction of Petroleum				
	Origin and formation of Petroleum;				
	Occurrence of petroleum				
	Origin and formation				
	Organic Theories				
	Physical Method				
	Biological Method				
	Oil exploration and production method				
Method of	Pen paper test				
Assessment	Ton puper sees				
Learning	Student will be able to estimate total oil reserves and	06	08		
Outcome 2	9				
Contents	Reserves and Deposits of World;				
	Petro Glimpses and Petroleum Industry in India				
	Composition of Petroleum				
	Classification of petroleum.				
Method of	Theory exam				
Assessment					
Course	Student will be able to Interpret Petroleum				
Outcome 2	processing data				
Learning	Student will be able to evaluate properties of	08	10		
Outcome 1	Petroleum fraction				
Contents	Evaluation of Petroleum				
	U.O.P. characterization factor				
	Correlation index				
	Distillation characteristics				
		1			

	The average December of a standard free stiens		
	Thermal Properties of petroleum fractions.		
	Specific heat		
	Viscosity and Viscosity index		
	Viscosity gravity constant		
M - 41 1 - C	Thermo viscosity		
Method of	Theory exam		
Assessment			
Learning	Student will be able to evaluate Distillation characteristics of	30	20
Outcome 2	Petroleum fraction		
Contents	Distillation characteristics,		
	Thermal Properties of petroleum fractions.		
	Specific heat		
	Viscosity and Viscosity index		
	Viscosity gravity constant		
	Thermo viscosity		
Method of	Practical exam		
Assessment			
Learning	Student will be able to eexplain important properties and their	10	10
Outcome 3	test methods	10	10
Contents	Important Products – Refinery Gas, Natural gas, associated		
Contents	gas, Dissolved gas, Casing head gas, Refinery off gas, LPG.		
	Properties and Test Methods.		
	Test for gasoline, Aviation turbine Fuels, Naphtha,		
	Kerosene's, Diesel, Lube oil-ASTM distillation, Reid vapor		
	pressure, Octane number, Gum content, Sulfur content		
	, Flash point and Fire point, Smoke point, Volatility, Sulfur		
	content, Aniline point, Diesel index, Calorific value,		
	Viscosity, conradson method, Oxidation stability		
Method of	Theory exam		
Assessment			
Learning	Perform Important test on petroleum and its products in	15	10
Outcome 4	laboratory		
Contents	Properties and Test Methods.		
	est for gasoline, Aviation turbine Fuels, Naphtha,		
	erosene's, Diesel, Lube oil-ASTM distillation, Reid vapor		
	pressure, Octane number, Gum content, Sulfur content		
	Flash point and Fire point, Smoke point, Volatility, Sulfur		
	content, Aniline point, Diesel index, Calorific value,		
	Viscosity, Conradson method, Oxidation stability		
Method of	Practical exam	03	30
Assessment			
Course	Student will be able to compare fractions of		
Outcome 3	Petroleum.		
Learning	Student will be able to describe Pre-treatment of	10	10
Outcome 1	petroleum of curds.		
	1 -		

	Duadoutian of actuals		
Contents	Production of petroleum		
	Pretreatment of petroleum crude		
	Dehydration of Crud		
	Desalting of Crudes – Electric Desalting		
	Chemical treatment		
	Gravity settling		
	Centrifugal separation		
	Stabilization of crude		
	Catalytic desulphurization process		
	Deasphalting process		
Method of	Pen paper test		
Assessment			
Learning	Student will be able to perform distillation in Petroleum	10	10
Outcome 2	Industry.		
Contents	Distillation of Petroleum-		
	Arrangement of towers		
	Top tray reflux		
	Pump back reflux and		
	Pump around reflux towers		
	Types of Distillation –		
	Atmospheric distillation unit		
	Vacuum Distillation unit		
	Corrosion in distillation unit		
1.1001100101	Theory Exam		
Assessment			
Learning	Student will be able to explain types of refineries and	08	10
Outcome 3	gasoline blending.		
Contents	Petroleum refinery		
	Classification		
	Simple refinery		
	Complex refinery		
	Fully integrated refinery		
	Refinery product		
	Blending of Gasoline		
	Batch type blending		
	Continuous blending		
	Blending Process,		
	Line blending		
	Gasoline Blending.,		
Method of	Pen paper test		
Assessment			
Course	Student will be able to understand treatment techniques for	12	12
Outcome 4	Petroleum and its products		
Learning	Student will be able to treat Gasoline, Kerosin, lubes and wax		

Outcome 1			
Contents	Fraction: - Impurities		
	Physical or Mechanical impurities		
	Chemical impurities		
	Purification of Petroleum		
	Gasoline Treatment		
	Sweetening process		
	Doctor sweetening process		
	Copper chloride sweetening process		
	Solutizer sweetening process		
	Hydro filling process		
	Treatment of Kerosine.		
	Treatment of lubes		
	Sulphuric acid treatment process		
	Clay treatment process		
	Wax purification		
	Dewaxing process		
	Chilling and pressing method		
	Propane dewaxing process		
	Urea dewaxing process		
Method of	Theory Exam		
Assessment			
Course	Students will be able to understand thermal and catalytic		
Outcome 5	properties.		
Learning	Students will be able to explain thermal and catalytical	10	10
Outcome 2	cracking.		
Contents	Cracking		
	Thermal and Catalytic Cracking.		
	Thermal cracking process		
	Dubbs thermal cracking process		
	Pyrolysis		
	Visbreaking		
	Coking		
	Catalytic cracking		
	Hourdrys fixed bed cracking		
	Thermofer catalytic cracking		
	Fluidised bed cracking		
	Hydrocracking		
	Naphtha Cracking.		
Method of	Theory exam		
Assessment			
Learning	Students will be able to Explain thermal and catalytic	10	10
Outcome 2	Reforming		
	Defermine		
Contents	Reforming Thormal and Catalytic reforming		
	Thermal and Catalytic reforming,		

	Comercial catalytic reforming process Fixed bed process Non regenerative process Regenerative process Moving bed process Thermofor catalytic reforming process Hyperforming process Fluidised bed process Fluidised by dreg forming process	
	Fludised hydro forming process	
Method of Assessment	Theory exam	

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code		Course Code	CO Code	LO Code	Format No. 4			
					\overline{C}	0	2		1	1		
COURS NAMI		Petroleum refinery	<u> </u>									
CO Descrij	ption	Describe origin, forma	tion and composition of p	petroleum.								
LO Descrip	ption	Explain origin and for	mation of Petroleum.									
				SCHEME O	FSTU	DY						
S. No.	I	earning Content	Teaching –Learning Method	Description of Process	T-L	Tea Hr:		Pract. /Tut Hrs	LRs Rec	quired		Remarks
1 2 3	Petrole Occurr petrole Origin Organi Physic Biolog	eum, t and formation of a eum; eence of	nteractive classroom eaching,quiz, assignment,tutorials.	Teacher will exp the contents and provide handout students. Teacher conduct assignment quiz/tutorial to restudents practice knowledge.	ts to er will nents/ nake	06			Handouts, cl PPT, text bo		rd,	
				SCHEME OFA	SSESS	MEN'	Γ					
S. No.	M	ethod of Assessment	Description of A	assessment		Maximum Marks		Resources Required				External /Internal
1		Pen paper test		pe asked toexplain origin nation of Petroleum. 10 (Test paper + Rating scale))	internal					

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

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RGPV (Diploma Wing) Bhopal		·	SCHEME FOR LEARNING OUTCOME		Branch Code		Course Code	CO Code	LO Code	Format No. 4		
					C	0	2		1	2		
	URSE AME	Petroleum refine	ery									
CO Des	O Description Describe origin, formation and composition of petroleum											
LO Des	scription	Estimate total oil re	eserves and classify petro	oleum on the basis of con	nposition.							
				SCHEME OF STU	DY							
S. No.	Lear	rning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.		act. t Hrs.	LRs Required		LRs Required Ren		Remarks
1	Reserves World;	and Deposits of	Interactive classroom teaching, demonstration, quiz,	Teacher will explain the contents and provide handouts to	06	00		Handouts, oboard, PPT		ζ.		
2		Glimpses and Industry in India	assignments, tutorial.	students. Teacher will conduct assignments/quiz/tutorial to make								
3		ion of Petroleum tion of petroleum.		students practice their knowledge.								
				SCHEME OF ASSESS	MENT							
S. No.	Metho	od of Assessment	Description of A	Assessment	dimum arks		F	Resources Re	equired		External /Internal	

/Internal

1	Theory Exam	Questions related to oil reserves, composition and classification	08	(Question paper +Rating scale)	External					
	ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)									
	Nil									

RGPV	(Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME		Bra	Branch Code			Course Code		CO Code	LO Code	Format No
				C	0	2				2	1	
COU.	Potroloum rotinory			1				'	'			
CO Desc	cription Interpret Petroleum pro	ocessing data										
LO Desc	eription Evaluate properties of	of Petroleum fraction										
	'		SCHEMI	E OF STU	ΟY							
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process		Tes	ach Hı	rs.	Pract. /Tut Hrs.		LRs Req	uired	Remarks
1	Petroleum, U.O.P.	Interactive classroom teaching, demonstration,	Teacher will explored contents and probability to stude	vide	08			00		ndouts, ch rd, charts.		
2	Correlation index,	quiz, assignments, Tutorial, presentation.	Teacher will con	duct z/tutorial practice								
3	petroleum fractions. Specific heat. Viscosity and Viscosity		then knowledge.									
5	index. Viscosity gravity constant Thermo viscosity.											
			SCHEME OI	F ASSESS	MENT							
S. No.	Method of Assessment	Description of		Maxim Marl	um			Resource	es Req	uired		External / Internal
1	Theory Exam	Student will be as Properties of pet fractions.	roleum	10			(Que	estion pap	oer +Rat	ting scale)	external

			ADDITIONAL 1	INSTRUCTIONS F	OR THE	HOD/1	FACUI	LTY (I	(F ANY)				
			Ni	1									
RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code			Course Code			CO Code	LO Code	Format No.	
					\boldsymbol{C}	0	2				2	2	
	COURSE NAME Petroleum refinery												
CO Desc	ription	Interpret Petroleum pr	ocessing data										
LO Desci	ription	Evaluate Distillation	characteristics of Pe	troleum fraction									
				SCHEME	OF STUI	ΟY							
S. No.		arning Content	Teaching – Learning Method	Description of T-L Process		Te	ach Hr	rs.	Pract. /Tut Hrs.		LRs Req	uired	Remarks

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1 2 3 4	Distillation characteristics, Thermal Properties of petroleum fractions. Specific heat Viscosity and Viscosity index Viscosity gravity constant Thermo viscosity	Lab -demonstration.	Teacher will explain the contents and provide handouts to students. Teacher will conduct lab assignments to make students practice their knowledge. Teacher will demonstrate the procedure of lab experiments Lab - demonstration	30	03	Handouts, chalk board, charts,Lab.	
5							

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
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1	Practical exam	Student will be asked to evaluate Distillation characteristics of Petroleum fraction	20	rating scale for practical's	Internal
		ADDITIONAL INSTRUCTIONS	FOR THE HOD/ FA	CULTY (IF ANY)	
		Nil			

R	RGPV (Diploma Wing) Bhopal		al		FOR LEARNING TCOME	G	Branch	Cod	e (Course Code	CO Code	LO Code	Format No. 4
				00	ICOME		C)	2		2	3	
	URSE AME	Petroleum refiner	y										
CO De	scription	InterpretPetroleum p	rocessing	data									
LO Des	scription	ExplainImportant	properties	s and their test m	ethods.								
		-			SCHEME O	F STUD	Y						
S. No.	Lea	rning Content		ng –Learning Method	Description o		Teach Hrs.		Pract. 'ut Hr	l Da l	Required		Remarks
2	Refinery associated Dissolved gas, Refin Properties Methods. Test for g turbine Fu Kerosene oil-ASTM vapor prenumber, C Sulfur con, Flash po Smokepo Sulfurcon Dieselind value, Vis	lgas, Casing head hery off gas, LPG. is and Test gasoline, Aviation hels, Naphtha, 's, Diesel, Lube M distillation, Reid hissure, Octane Gumcontent,	teaching	ive classroom g,demonstration ssignments,	Teacher will ex the contents and provide handou students. Teach will conduct assignments/ quiz/tutorial to students practic their knowledge	ts to er make ee e.	10	00		Handouts board, PP		ok,	
				S	SCHEME OF A								T 4 1 '
S. No.	Meth	od of Assessment	Г	Description of As	ssessment	Maxii Mai				Resources Re	quired		External / Internal

1		Γheory exam	Те	sting of ma		10		(Question paper +Rating scale) CULTY (IF ANY)			le)	External
			ADDITION	AL INSTR	Nil	HE HOL)/ F A	CULI	Y (IF AINY)			
R	.GPV (Di _I	oloma Wing) Bhop	oal S		FOR LEARNING	Bra	nch C	ode	Course Code	CO Code	LO Code	Format No. 4
	URSE AME	Petroleum refiner	·y		TCOME	С	0	2		2	4	
CO De	scription	Interpret Petroleum p Perform Important	• •	um and its	products in laborator	ry.						
		•	•		SCHEME OF S'	ΓUDY						
S. No.	Lea	rning Content	Teaching – Meth	_	Description of T- Process		ach rs.	Pra /Tut	I Da I	Required		Remarks
2	Methods. Test for g turbine Fu Kerosene oil-ASTM vapor pre number, O Sulfur con , Flash po Smoke po	gasoline, Aviation uels, Naphtha, 's, Diesel, Lube I distillation, Reid ssure, Octane Gum content,	Lab demonstra	ation	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge. Teacher will demonstrate the procedure of labe experiments Lab -)		30	Handouts board, PP La		ok,	

Conradson method, Oxidation stability				
	SCHEME OF A	ASSESSMENT		
S. No. Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
Practical exam	Student will be asked to perform Testing of materials.		rating scale for practical's	External
1		30		
	ADDITIONAL INSTRUCTIONS FO	OR THE HOD/ F	ACULTY (IF ANY)	
	N	il		

RGPV (Dipl	oma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code C 0 2	Course Code	CO Code	LO Code	Format No. 4
COURSE NAME	Petroleum refinery						
CO Description	Compare fractions of Petr	oleum.					
LO Description	Describe Pretreatment of p	etroleum.					

SCHEME OF STUDY									
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks		
1 2 3 4 5 6 7 8 9 10	Production of petroleum Pretreatment of petroleum crude Dehydration of Crude Desalting of Crudes – Electric Desalting Chemical treatment Gravity settling Centrifugal separation Stabilization of crude Catalytic desulphurization process Deasphalting process	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	10	00	Handouts, chalk board, PPT, text book.			

		SCHEME OF A	SSESSMENT		
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Pen paper test	Questions related to pretreatment of crude will be asked			Internal
1			10	(Test paper + Rating scale)	
		ADDITIONAL INSTRUCTIONS FO		CULTY (IF ANY)	

	RGPV (Di	ploma Wing) Bhopal	SCHEME FOR LEARNING	Bran	ch Code		Co	urse Code	CO Code	LO Code	Format No. 4
		•	OUTCOME	\boldsymbol{C}	0	2			3	2	
	COURSE NAME	Petroleum refinery									
C	O Description	To Compare fractions of Petro	leum.								

LO Description Perform distillation in Petroleum in Industry.

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	VII.	\mathbf{O}	\mathbf{U}	

			CHENIE OF STOP				
S. No.	Learning Content	Teaching — Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1 2 3 4	Distillation of Petroleum-Arrangement of towers Top tray reflux Pump back reflux and Pump around reflux towers Types of Distillation — Atmospheric distillation unit Vacuum Distillation unit Corrosion in distillation unit	teaching, demonstration, quiz,	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	10	00	Handouts, chalk board, charts.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory Exam	Student will be asked to describe Distillation used in Petroleum Industry.	10	(Question paper +Rating scale)	External

${\bf ADDITIONAL\ INSTRUCTIONS\ FOR\ THE\ HOD/\ FACULTY\ (IF\ ANY)}$

Nil

R	RCPV (Dinloma Wing) Rhonal			FOR LEARNING UTCOME		ı Coc			Course Code		CO Code	LO Code	Format No. 4	
				00	JICOME	$C \qquad O \qquad Z$		2			3 3			
	URSE AME	Petroleum refiner	·y											
CO Des	scription	To Compare fraction	ons of Petr	oleum.										
LO Des	scription	To explain types of a	refineries a	nd gasoline blend	ing									
	_				SCHEME OF	STUDY								
S. No.	Lea	rning Content	Teach	ning –Learning Method	Description of Process	T-L	,	Teacl Hrs.		Pra /Tu Hr	ıt		LRs Require	Remark
3	Classification, Simple refinery, Complex refinery, Fully integrated refinery, Refinery product, Blending of Gasoline, Batch type blending, Continuous blending, Blending Process, Lineblending Gasoline Blending.		Teacher will cond assignments/ quiz	handouts to students. l conduct y quiz/tutorial to make ctice their knowledge		8	00		boar	Handouts, chalk board, PPT, text book, charts.				
					SCHEME OF AS	SESSMENT								
S. No.	Meth	od of Assessment	I	Description of A	assessment	Maximum Marks			Res	source	s Re	quired		External / Internal
]	Pen paper test	Stuc	dent will be aske	ed to explain									

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

10

(Test paper +Rating scale).

Internal

Student will be asked to explain Blending Process.

1

Nil

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING	Bra	anch C	ode	Cou	rse Code	CO Code	LO Code	Format No. 4
		OUTCOME	$\boldsymbol{\mathcal{C}}$	0	2	2		4	1	
COURSE NAME	Petroleum refinery	Petroleum refinery								
CO Description	To understand treatment techniques for Petroleum and its products									
LO Description	To treat Gasoline, Kerosene ,lubes and wax									

			SCHEME OF STUDY				
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1 2 3 4 5	Fraction: - Impurities Physical or Mechanical impurities Chemical impurities Purification of Petroleum Gasoline Treatment Sweetening process Doctor sweetening process Copper chloride sweetening process Solutizer sweetening process Hydro filling process Treatment of Kerosine. Treatment of lubes Sulphuric acid treatment process Clay treatment process Wax purification Dewaxing process Chilling and pressing method Propane dewaxing process Urea dewaxing process	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	12	00	Handouts, chalk board, PPT, text book, charts.	

		SCHEME OF	FASSESSMENT		
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	theory exam	Student will be asked to GasolineTreatment and Treatment of	12	(Question paper +Rating scale)	External
		Kerosine.			

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IFANY)

Nil

RGPV (Di	ploma Wing) Bhopal		IE FOR LEARNING	Bran	nch C	ode	Course Code Code Code F			Format No. 4
			OUTCOME	C	0	2		5	1	
COURSE NAME	Petroleum refinery									
CO Description	To understand thermal and o	catalytic prope	erties							
LO Description										
			SCHEME OF STU	DY						
						P	ract.			

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teac h Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1 2	Cracking Thermal and Catalytic Cracking.	Interactive classroom teaching, demonstration, quiz,	Teacher will explain the contents and provide handouts to students. Teacher will	10	00	Handouts, chalk board, PPT, text book, charts.	
3	Thermal cracking process Dubbs thermal cracking process Pyrolysis Visbreaking	assignments, tutorial.	conduct assignments/ quiz/tutorial to make students practice their knowledge.			book, charts.	
4	Coking Catalytic cracking Hourdrys fixed bed cracking Thermofer catalytic cracking Fludised bed cracking Hydrocracking Naphtha Cracking.						

S. No. Method of Assessment Description of Assessment Maximum Marks Theory Exam Student will be asked to describe Cracking 10 (Question paper +Rating scale)

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Nil
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RG	SPV (Diploma Win	g) Bhopal	·	OR LEARNING	Bran	nch Cod	ch Code Course C		CO Code	LO Code	Format No. 4
	· · (= - F	5 / · F ·	OUT	TCOME	C	0	2		5	2	
COURSE NAME Petroleum refinery			refinery								
CO Desc	ription	To understa	and thermal and catalytic p	roperties							
LO Description Explain thermal and catalytic Reforming											
				SCHEME OF ST	UDY						
S. No.	Learning (Content	Teaching – Learning Method Description of T-L Process Hrs. Pract. / Tut Hrs. LRs Required					ired	Remarks		
1 2	Reforming Thermal and Cat reforming, Comercial cataly reforming proces Fixed bed proces Non regenerative Regenerative pro Moving bed proc Thermoforming, reforming proces Hyperforming pr Fluidized bed pro Fluidized hydro f process	tic ss ss e process ecess ccatalytic ss cocess cocess	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will exp contents and pro handouts to stud Teacher will con assignments/ quiz/tutorial to n students practice knowledge.	vide ents. iduct	10	00		douts, cha d, PPT, te ts.		
			SC	HEME OF ASSES	SMENT						
S. No.	Method of A	ssessment	Description of As	sessment	Maximum					External Internal	

1	Theory Exam	Student will be asked to describe reforming.	10	(Question paper +Rating scale)	External
		ADDITIONAL INSTRUCTIONS FOR	THE HOD/ FA	ACULTY (IF ANY)	
		nil			

S.No.	NAME OF EXPERIMENT	СО	LO
1	Determine the viscosity of given oil sample by red wood viscometer (No. 1)	2	2
2	Determine the viscosity of given oil sample by red wood viscometer (No. 2)	2	2
3	Determine the flash point and fire point of given oil sample by Pensky – martin apparatus. (Open cup)	2	4
4	Determine the flash point and fire point of given oil sample by Pensky – martin apparatus. (Close cup)	2	4
5	Determine the flash point and fire point of given oil sample by Abels apparatus.	2	4
6	Determine the composition of an unknown oil petroleum mixture using the Ostwald viscometer.	2	2
7	Determine the distillation characteristics of petroleum products.	2	2
8	Determine the drop point of grease.	2	4
9	Determine pour point of oil sample.	2	4
10	Determine the Conradson carbon residue.	2	4
11	Determine the smoke point of given kerosene sample.	2	4
12	Determine the penetration index by penetrometer.	2	4