

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					R	0	1	4	0	3	1	1	
COURSE NAME	BASICS OF REFRIGERATION AND AIR CONDITIONING												
CO 1 Description	Calculate the COP of air refrigeration cycles												
LO 1 Description	Explain the basic of air refrigeration cycles												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks				
1	Definition of Refrigeration, method of refrigeration, Law’s of refrigeration, principles of refrigeration, unit of refrigeration, coefficient of performance, rating of refrigeration machines , difference between COP and efficiency, Comparison Of Heat Engine , Refrigerator And Heat Pump , solve simple numerical problem	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.	08	----	Handouts, chalk board, PPT, text book, charts, video film.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment		Maximum Marks	Resources Required			External / Internal					
1	Part of progressive 1	Student will be asked to define Refrigeration ,COP ,difference between Heat Engine , Refrigerator And Heat Pump , simple numerical problem related to COP		10	Question paper + Rating scale			Internal					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													

Nil

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					R	0	1	4	0	3	1	2	
COURSE NAME	BASICS OF REFRIGERATION AND AIR CONDITIONING												
CO 1 Description	Calculate the COP of air refrigeration cycles												
LO 2 Description	Calculate the COP of reversed Carnot cycle and Bell Coleman cycle for given conditions												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Working of Reversed Carnot Cycle and Bell- Coleman Refrigerator Cycle their representation on PV-TS Diagram, Limitations, Applications, Major application areas of refrigeration simple numerical problem	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.	08	-----	Handouts, chalk board, PPT, text book.							
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 Refrigerator Working On Reversed Carnot Cycle with PV-TS Diagramme , Working of	10	Test paper + Rating scale			(External)						

		Bell- Coleman, solve simple numerical problem			
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ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Nil

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					R	0	1	4	0	3	1	3	
COURSE NAME	BASICS OF REFRIGERATION AND AIR CONDITIONING												
CO 1 Description	Calculate the COP of air refrigeration cycles												
LO3 Description	Draw Various Air Refrigeration Systems used in Aircraft												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Simple air cooling, Bootstrap air cooling, Reduced ambient and Regenerative air refrigeration systems.	Interactive classroom 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.	8		Handouts, chalk board, charts, video film, virtual lab.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Term Work	Student will be asked To Simple air cooling, Bootstrap air cooling refrigeration systems.	10	Rubrics/Rating scale			Internal						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													

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					R	0	1	4	0	3	2	1	
COURSE NAME	BASICS OF REFRIGERATION AND AIR CONDITIONING												
CO 2 Description	Analyze Given Vapor Compression Refrigeration System												
LO 1 Description	Explain the working of vapor compression refrigeration system												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Components of Vapour Compression Refrigeration Cycle, Working of simple Vapour Compression Refrigeration Cycle With P-h & T-S diagram, Applications of Vapour Compression Refrigeration System, Merit and Demerits of Air refrigeration and Vapour Compression Refrigeration System.	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.	06	----	Handouts, chalk board, PPT, text book, charts, video film.							
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 Components of Vapour Compression Refrigeration Cycle Working of simple Vapour Compression Refrigeration Cycle With Ph-TS diagram	10	Question paper + Rating scale	External								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

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					R	0	1	4	0	3	2	2	
COURSE NAME		BASICS OF REFRIGERATION AND AIR CONDITIONING											
CO2 Description		Analyze Given Vapor Compression Refrigeration System											
LO2 Description		Calculate Cooling Capacity And Coefficient Of Performance for Given Situations											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks				
1	Dry, Wet, Superheated Compression , Effect Of Sub Cooling and Super Heating on the Cycle Performance, Effect of suction and discharge Pressure , Simple Problems With The Use Of Refrigeration Charts And Tables	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will demonstrate the procedure of lab experiments. The students will learn through practice.	8		Handouts, chalk board, PPT, text book, charts, video film.							
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 dry, wet ,superheated Effect Of Sub Cooling And Super Heating		10	Observation schedule/ check-list / rating scale / rubrics			External					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Part of external practical													

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					<i>R</i>	<i>0</i>	<i>1</i>	<i>4</i>	<i>0</i>	<i>3</i>	<i>2</i>	<i>3</i>	
COURSE NAME	BASICS OF REFRIGERATION AND AIR CONDITIONING												
CO2 Description	Analyze Given Vapor Compression Refrigeration System												
LO3 Description	Select Suitable Method for Performance Improvements of Simple Saturated Vapour Compression Refrigeration Cycle												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks				
1	Types of improvement in Vapour compression cycle -Improvement by adding Flash Chamber, adding Accumulator, Sub cooling of liquid refrigerant by using Vapour of refrigerant, Sub cooling of liquid refrigerant by using Liquid refrigerant	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will demonstrate the procedure of lab experiments. The students will learn through practice.	7		Handouts, chalk board, charts, video film, virtual lab.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment		Maximum Marks	Resources Required			External / Internal					
1	Laboratory test by observation	Student will be asked to Types of improvement in Vapour compression cycle by adding Flash Chamber, adding Accumulator, Sub cooling of liquid refrigerant by using Vapour of refrigerant, Sub cooling of liquid refrigerant by using Liquid refrigerant		15	Question paper + Rating scale			External					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

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					R	0	1	4	0	3	3	1	
COURSE NAME	BASICS OF REFRIGERATION AND AIR CONDITIONING												
CO3 Description	Explain Various Vapour Absorption Refrigeration Systems												
LO1 Description	Explain Working Principle of Vapor Absorption Refrigeration System												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Explain Construction and Working of Simple Vapor Absorption Refrigeration System, Domestic Electrolux, Practical H ₂ O - NH ₃ Vapor Absorption Refrigeration System, Li-Br Absorption Refrigeration System, Solar Power Refrigeration System	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.	07		Handouts, chalk board, PPT, text book, charts, video film.							
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 working of simple vapor absorption, Domestic Electrolux,	10	Question paper + Rating scale	External								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

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					R	0	1	4	0	3	3	2	
COURSE NAME	BASICS OF REFRIGERATION AND AIR CONDITIONING												
CO3 Description	Explain Various Vapour Absorption Refrigeration Systems												
LO2 Description	Select Appropriate Refrigeration System From Vapour Compression Refrigeration, Vapor Absorption Refrigeration System And Solar Power Refrigeration System												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Advantage and disadvantage also comparison of vapour absorption refrigeration system over vapour compression refrigeration system advantages and disadvantages of solar power refrigeration system over vapour compression system	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will demonstrate the procedure of lab experiments. The students will learn through practice.	2	3	Handouts, chalk board, PPT, text book, charts, video film.							
Advantage and disadvantage also comparison of vapour absorption refrigeration system over vapour compression refrigeration system advantages and disadvantages of solar power refrigeration system over vapour compression system													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Laboratory work (Internal)	Student will be asked To Advantage and disadvantage and comparison of vapour absorption refrigeration system over vapour compression refrigeration system	10	Observation schedule/ check-list / rating scale / rubrics			Internal						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Part of external practical													

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					R	0	1	4	0	3	4	1	
COURSE NAME	BASICS OF REFRIGERATION AND AIR CONDITIONING												
CO4 Description	Select Appropriate Refrigerant for Particular Application												
LO1 Description	Explain Various Refrigerants, Its Properties and Applications												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Functions, Classification of Refrigerants, Nomenclature of Refrigerants, Desirable Properties of Ideal Refrigerant, Selection of Refrigerant, Properties and Applications of Commonly Used Refrigerants in Vapor Compression Refrigeration system.	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.	07	-----	Handouts, chalk board, PPT, text book, charts, video film, virtual lab.							
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 Functions, classification of refrigerants, Desirable properties of refrigerant, selection of refrigerant	10	Question paper + Rating scale	External								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

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					R	0	1	4	0	3	4	2	
COURSE NAME		BASICS OF REFRIGERATION AND AIR CONDITIONING											
CO4 Description		Select Appropriate Refrigerant for Particular Application											
LO2 Description		Suggest the Suitable Refrigerant in Current Scenario Regarding Environmental Contemporary Issues.											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Refrigerants and Environmental issues, Ozone Depletion Potential (ODP) and Global Warming (GW), Montreal and Kyoto protocols, Total Equivalent Warming Index (TEWI), Alternative to existing CFC and HCFC Refrigerants. Future Industrial Refrigerants.	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.	8		Handouts, chalk board, PPT, text book, charts, video film, virtual lab.							
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 Refrigerants and environmental issues Ozone Depletion Potential (ODP) and Global Warming (GW), alternative to existing CFC and HCFC refrigerants. Future industrial refrigerants.	10	Test paper + Rating scale	External								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

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					<i>R</i>	<i>0</i>	<i>1</i>	<i>4</i>	<i>0</i>	<i>3</i>	<i>5</i>	<i>1</i>	
COURSE NAME	BASICS OF REFRIGERATION AND AIR CONDITIONING												
CO5 Description	Explain Basics of Air Conditioning												
LO1 Description	Define Basic Terms of Psychrometry												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Dry air ,moist air, saturated air, degree of saturation, humidity absolute humidity , relative humidity, dry bulb temperature, wet bulb temperature, dew point temperature, wet bulb depression ,dew point depression , psychometric chart and its uses.	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.	7	-----	Handouts, chalk board, PPT, text book, charts, video film, virtual lab.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Part of progressive2 (internal)	Student will be asked to Dry air ,moist air, saturated air, degree of saturation, humidity absolute humidity , relative humidity, dry bulb temperature, wet bulb temperature, dew point temperature, wet bulb depression ,dew point depression , psychometric chart and its uses	10	Question paper + Rating scale			Internal						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Part of term work													

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					R	0	1	4	0	3	5	2	
COURSE NAME	BASICS OF REFRIGERATION AND AIR CONDITIONING												
CO5 Description	Explain Basics of Air Conditioning												
LO2 Description	Determine Various Air Properties Using Psychrometer And Psychrometric Chart												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	properties of moist air, Daltons law of partial pressure, Gibbs theorem psychometric relations, psychometry properties, specific humidity or humidity ratio degree of saturation, relative humidity pressure of water vapour vapour density, enthalpy of moist air, humid specific heat Sling psychrometere and its uses, Representation of Psychometric properties on chart (simple numerical using chart)	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 practicetheir knowledge.	8	4	Handouts, chalk board, PPT, text book, charts, video film, virtual lab.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Laboratory test by observation	Student will be asked to properties of moist air, psychometry properties	15	Board or PPT Presentation	External								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

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					R	0	1	4	0	3	5	3	
COURSE NAME		BASICS OF REFRIGERATION AND AIR CONDITIONING											
CO5 Description		Explain Basics of Air Conditioning											
LO3 Description		Plot and Interpret Various Air Conditioning Processes on Psychometric Chart											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks				
1	Sensible Cooling ,Sensible Heating ,Humidification’s , Dehumidification’s, Cooling And Humidification’s ,Cooling And dehumidification, Heating And Humidification’s , Heating and dehumidification , By pass Factor, ADP	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.	08		Handouts, chalk board, charts, video film, virtual lab.							
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 Sensible Cooling ,Sensible Heating ,Humidification’s , Dehumidification’s, Cooling And Humidification’s ,Cooling And dehumidification, Heating And Humidification’s By pass Factor, ADP	10	Test Paper + Rating Scale			External						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													

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					<i>R</i>	<i>0</i>	<i>1</i>	<i>4</i>	<i>0</i>	<i>3</i>	<i>5</i>	<i>4</i>	
COURSE NAME	BASICS OF REFRIGERATION AND AIR CONDITIONING												
CO5 Description	Explain the basics of air conditioning												
LO4 Description	List & Identify Different Air Conditioning Systems with Relevant Auxiliary Components for Given Air Conditioning System												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks				
1	summer , winter and year round air conditioning ,industrial air conditioning Components used for air conditioning humidifier, dehumidifier ,cooling and heating coil, filters , air washer, Evaporative Cooler	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..	06		Handouts, chalk board, charts, video film, virtual lab.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Laboratory work (internal)	Student will be asked to summer , winter and year round air conditioning ,industrial air conditioning	10	Question paper + Rating scale			Internal						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Nil													

