CARE COLLEGE OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

ODD SEMESTER 2021-2022 TIME TABLE – UNIT TEST- I (04.09.2021 TO 07.09.2021)

DATE	SESSION	IV YEAR		III YEAR		II YEAR	
04.09.2021	FN 10:00 AM TO 10.45 AM	ME8099	ROBOTICS	ME8595	THERMAL ENGINEERING- II	CE8394	FLUID MECHANICS AND MACHINERY
	AN 3:00 P.M TO 3.45 P.M	OML751	TESTING OF MATERIALS	ME8501	METROLOGY AND MEASUREMENTS	ME8351	MANUFACTURING TECHNOLOGY - I
06.09.2021	FN 10:00 AM TO 10.45 AM	ME8791	MECHATRONICS	ME8594	DYNAMICS OF MACHINES	MA8353	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS
	AN 3:00 P.M TO 3.45 P.M	GE8077	TOTAL QUALITY MANAGEMENT	ORO551	RENEWABLE ENERGY RESOURCES	EE8353	ELECTRICAL DRIVES AND CONTROLS
07.09.2021	FN 10:00 AM TO 10.45 AM	ME8792	POWER PLANT ENGINEERING	ME8593	DESIGN OF MACHINE ELEMENTS	ME8391	ENGINEERING THERMODYNAMICS
	AN 3:00 P.M TO 3.45 P.M	ME8793	PROCESS PLANNING AND COST ESTIMATION	****	**********	****	**********

EXAM CELL

Principal

CT-1 Timetable for II year

CARE COLLEGE OF ENGINEERING

II YEAR - ODD SEMESTER (2021-2022) TIME TABLE – CYCLE TEST- I (23.09.2021 TO 25.09.2021)

DATE	SESSION	CIVIL	CSE	ECE	MECH	AI & DS
23.09.2021	FN 10:00 AM TO 11.30 AM	**CE8392** - ENGINEERING GEOLOGY	**MA8351** - DISCRETE MATHEMATICS	**EC8392** - DIGITAL ELECTRONICS	**CE8394** - FLUID MECHANICS AND MACHINERY	**MA8351** - DISCRETE MATHEMATICS
	AN 2:30 P.M TO 4.00 P.M	**CE8301** - STRENGTH OF MATERIALS -I	**EC8395** - COMMUNICATION ENGINEERING	**EC8391** - CONTROL SYSTEMS ENGINEERING	**ME8351** - MANUFACTURING TECHNOLOGY - I	**AD8301** - INTRODUCTION TO OPERATING SYSTEMS
24.09.2021	FN 10:00 AM TO 11.30 AM	**MA8353** - TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	**CS8351** - DIGITAL PRINCIPLES AND SYSTEM DESIGN	**MA8352** - LINEAR ALGEBRA AND PARTIAL DIFFERENTIAL EQUATIONS	**MA8353** - TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	**AD8302** - FUNDAMENTALS OF DATA SCIENCE
	AN 2:30 P.M TO 4.00 P.M	**CE8351** - SURVEYING	**CS8391** - DATA STRUCTURES	**EC8351** - ELECTRONIC CIRCUITS- I	**EE8353** - ELECTRICAL DRIVES AND CONTROLS	**AD8351** - DESIGN AND ANALYSIS OF ALGORITHMS
25.09.2021	FN 10:00 AM TO 11.30 AM	**CE8302** - FLUID MECHANICS	**CS8392** - OBJECT ORIENTED PROGRAMMING	**EC8352** - SIGNALS AND SYSTEMS	**ME8391** - ENGINEERING THERMODYNAMICS	**CS8392** - OBJECT ORIENTED PROGRAMMING
	AN 2:30 P.M TO 4.00 P.M	**CE8391** - CONSTRUCTION MATERIALS	****	**EC8393** - FUNDAMENTALS OF DATA STRUCTURES IN C	****	****

EXAM CELL

Principal

CARE COLLEGE OF ENGNEERING

DEPARTMENT OF MECHANICAL ENGINEERING

ODD SEMESTER 2021-2022 TIME TABLE – UNIT TEST- II (12-10-21, 13-10-21& 16-10-21)

DATE	SESSION	IV YEAR		III YEAR		II YEAR	
12.10.2021	FN 10:00 AM TO 10.45 AM	ME8099	ROBOTICS	ME8595	THERMAL ENGINEERING- II	CE8394	FLUID MECHANICS AND MACHINERY
	AN 3:00 P.M TO 3.45 P.M	OML751	TESTING OF MATERIALS	ME8501	METROLOGY AND MEASUREMENTS	ME8351	MANUFACTURING TECHNOLOGY - I
13.10.2021	FN 10:00 AM TO 10.45 AM	ME8791	MECHATRONICS	ME8594	DYNAMICS OF MACHINES	MA8353	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS
	AN 3:00 P.M TO 3.45 P.M	GE8077	TOTAL QUALITY MANAGEMENT	ORO551	RENEWABLE ENERGY RESOURCES	EE8353	ELECTRICAL DRIVES AND CONTROLS
16.10.2021	FN 10:00 AM TO 10.45 AM	ME8792	POWER PLANT ENGINEERING	ME8593	DESIGN OF MACHINE ELEMENTS	ME8391	ENGINEERING THERMODYNAMICS
	AN 3:00 P.M TO 3.45 P.M	ME8793	PROCESS PLANNING AND COST ESTIMATION	****	*********	****	*********

EXAM CELL

Principal

CARE COLLEGE OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

ODD SEMESTER 2021-2022 TIME TABLE – CYCLE TEST- II (08.11.2021 TO 10.11.2021)

DATE	SESSION	IV YEAR		III YEAR		II YEAR	
08.11.2021	FN 10:00 A.M TO 11.30 A.M	ME8099	ROBOTICS	ME8595	THERMAL ENGINEERING- II	CE8394	FLUID MECHANICS AND MACHINERY
	AN 02:15 P.M TO 3.45 P.M	OML751	TESTING OF MATERIALS	ME8501	METROLOGY AND MEASUREMENTS	ME8351	MANUFACTURING TECHNOLOGY - I
09.11.2021	FN 10:00 A.M TO 11.30 A.M	ME8791	MECHATRONICS	ME8594	DYNAMICS OF MACHINES	MA8353	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS
	AN 02:15 P.M TO 3.45 P.M	GE8077	TOTAL QUALITY MANAGEMENT	ORO551	RENEWABLE ENERGY SOURCES	EE8353	ELECTRICAL DRIVES AND CONTROLS
10.11.2021	FN 10:00 A.M TO 11.30 A.M	ME8792	POWER PLANT ENGINEERING	ME8593	DESIGN OF MACHINE ELEMENTS	ME8391	ENGINEERING THERMODYNAMICS
	AN 02:15 P.M TO 3.45 P.M	ME8793	PROCESS PLANNING AND COST ESTIMATION	****	*********	****	*********

EXAM CELL

PRINCIPAL

CARE COLLEGE OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

ODD SEMESTER 2021-2022 TIME TABLE – MODEL EXAMINATION (22.11.2021 TO 27.11.2021)

DATE	SESSION	IV YEAR		III YEAR		II YEAR	
22.11.2021 (MON)	FN 01:00 P.M TO 04.00 P.M	ME8099	ROBOTICS	ME8595	THERMAL ENGINEERING- II	CE8394	FLUID MECHANICS AND MACHINERY
23.11.2021 (TUE)	FN 01:00 P.M TO 04.00 P.M	OML751	TESTING OF MATERIALS	ME8501	METROLOGY AND MEASUREMENTS	ME8351	MANUFACTURING TECHNOLOGY - I
24.11.2021 (WED)	FN 01:00 P.M TO 04.00 P.M	ME8791	MECHATRONICS	ME8594	DYNAMICS OF MACHINES	MA8353	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS
25.11.2021 (THU)	FN 01:00 P.M TO 04.00 P.M	GE8077	TOTAL QUALITY MANAGEMENT	ORO551	RENEWABLE ENERGY SOURCES	EE8353	ELECTRICAL DRIVES AND CONTROLS
26.11.2021 (FRI)	FN 01:00 P.M TO 04.00 P.M	ME8792	POWER PLANT ENGINEERING	ME8593	DESIGN OF MACHINE ELEMENTS	ME8391	ENGINEERING THERMODYNAMICS
27.11.2021 (SAT)	FN 01:00 P.M TO 04.00 P.M	ME8793	PROCESS PLANNING AND COST ESTIMATION	****	*********	****	*********

EXAM CELL

PRINCIPAL

Roll Number							

CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT OF MECHANICAL ENGINEERING

CLASS:	:	**II B.E MECHANICAL**	**MAX MARKS**	:	**40**
SEMESTER:	:	**III**	**DURATION**	:	**01.00 Hrs**
SUBJECT:	:	**Engineering Thermodynamics**	**CODE**	:	**ME8391**
COURSE NO	:	**C391**	**DATE**	:	**07.09.2021**
ACADEMIC YEAR	:	**2021 – 22 (ODD)**	**EXAM**	:	**Unit Test 1**

PART – A (6 X 2 = 12 Marks)				
I	**ANSWER ALL QUESTIONS**		**BT level**	**CO**
	1.	Explain Isothermal process with PV diagram	K2	C391.1
	2.	Summarize thermodynamic equilibrium.	K2	C391.1
	3.	Differentiate between point function and path function.	K1	C391.1
	4.	Define Zeroth Law of thermodynamics. Why it is so called?	K2	C391.1
	5.	State the first law for a closed system undergoing a process and a cycle.	K1	C391.1
	6.	Define Second law of thermodynamics	K1	C391.1

PART – B (1 X 13 = 13 Marks)							
II	**ANSWER ALL QUESTIONS**				**Marks**	**BT Level**	**CO**
	07.	(a)		Briefly explain the following: (i) Point and path function (ii) Property state process and path (iii) Quasi-static process.	13	K2	C391.1
				(OR)			
		(b)		A vessel of capacity 3 m^3 contains air at a pressure of 1.5 bar and a temperature of 25°C. Additional air is now pumped into the system until the pressure rises to 30 bar and temperature rises to 60°C. Determine the mass of air pumped in and express the quantity as a volume at a pressure of 1.02 bar and a temperature of 20°C. if the vessel is allowed to cool until the temperature is again 25°C, calculate the pressure in the vessel.	13	K4	C391.1
III	**ANSWER ALL QUESTIONS**				**Marks**	**BT Level**	**CO**
	PART – C (15 X 1 = 15 Marks)						
	8 to 17			Multiple Choice Questions https://forms.gle/SLCEQEcMLj5EDEue7	15		

Blooms Levels: K1 - Remember, K2 – Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

Faculty In-charge **HOD** **Principal**

Roll Number							

CARE COLLEGE OF ENGINEERING, TRICHY
DEPARTMENT OF MECHANICAL ENGINEERING

CLASS:	:	**II B.E MECHANICAL**	**MAX MARKS**	:	**50**
SEMESTER:	:	**III**	**DURATION**	:	**01.30 Hrs**
SUBJECT:	:	**ENGINEERING THERMODYNAMICS**	**CODE**	:	**ME8391**
COURSE NO	:	**C391**	**DATE**	:	**25.09.2021**
ACADEMIC YEAR	:	**2021 – 22 (ODD)**	**EXAM**	:	**Cycle Test - 1**

PART – A (7 X 2 = 14 Marks)				
I	**ANSWER ALL QUESTIONS**		**BT level**	**CO**
	1.	Express flow Energy.	K1	C391.1
	2.	What is reversed heat engine?	K1	C391.2
	3.	Define Clausius inequality with its expression.	K4	C391.1
	4.	What is thermal energy reservoir? Explain the term source and Sink.	K1	C391.2
	5.	Define the availability?	K1	C391.2
	6.	Sketch the p-V and T - s diagrams for Carnot cycle	K2	C391.2
	7.	Define the un-available energy with examples.	K2	C391.2

PART – B (2 X 13 = 26 Marks)							
II	**ANSWER ALL QUESTIONS**				**Marks**	**BT Level**	**CO**
	08.	(a)		Derive the steady flow energy equation and reduce it for a Turbine, pump, nozzle and a heat exchanger.	13	K2	C605.1
				(OR)			
		(b)		The food compartment of a refrigerator is maintained at 4°C by removing heat from it at a rate of 360 KJ/min. If the required power input to the refrigerator is 2KW, draw a block diagram and determine: 1. The Coefficient of performance of the refrigerator. 2. The rate of heat rejection to the room that houses the refrigerator.	13	K4	C605.2
	09.	(a)		A heat pump is used to meet the heating requirement of a house and maintain it 20°C. On a day when the outdoor air temperature drops to 2°C, the house is estimated to lose heat at a rate of 80,000 KJ/hr. If the heat pump under these conditions has a COP of 2.5, determine the power consumed by the heat pump in KW. Compare COP heat pump if it works on Carnot principle between the same temperature limits.	13	K5	C605.1
				(OR)			
		(b)		Air flows through as adiabatic compressor at 2 kg/sec. The inlet conditions are 100 KPa and 310 K and the exit conditions are 700 KPa and 560 K. Consider T0 to be 298 K. Determine the change of availability and irreversibility.	13	K3	C605.2
III	**ANSWER ALL QUESTIONS**				**Marks**	**BT Level**	**CO**
PART – C (10 X 1 = 10 Marks)							

	10 to 19		Multiple Choice Questions **https://forms.gle/9Xcvk5E1UFsNA2Lu9**	10		

Blooms Levels: K1 - Remember, K2 – Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

Faculty In-charge **HOD** **Principal**

Roll Number							

CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT OF MECHANICAL ENGINEERING

CLASS:	:	**II B.E MECHANICAL**	**MAX MARKS**	:	**40**
SEMESTER:	:	**III**	**DURATION**	:	**45 mins**
SUBJECT:	:	**Engineering Thermodynamics**	**CODE**	:	**ME8391**
COURSE NO	:	**C391**	**DATE**	:	**16.10.2021 FN**
ACADEMIC YEAR	:	**2021 – 22 (ODD)**	**EXAM**	:	**Unit Test II**

PART – A (6 X 2 = 12 Marks)				
I	**ANSWER ALL QUESTIONS**		**BT level**	**CO**
	1.	Define Exergy.	K1	C391.3
	2.	Draw P-T (Pressure-Temperature) diagram of a pure substance	K1	C391.3
	3.	What is meant by dryness fraction of the steam?	K1	C391.3
	4.	Summarize the advantages of using superheated steam in turbines.	K1	C391.3
	5.	Define pure substance.	K1	C391.3
	6.	Give triple point represented in P-V diagram.	K1	C391.3

PART – B (1 X 13 = 13 Marks)							
II	**ANSWER ALL QUESTIONS**				**Marks**	**BT Level**	**CO**
	07.	(a)		Explain the steam formation with relevant sketch and label all salient points and explain every point in detail.	13	K1	C391.3
				(OR)			
		(b)		When will you call a vapour superheated? Also, when will you call a liquid as compressed liquid? Give examples for both and explain with Temperature vs Volume (T-V) diagram.	13	K1	C391.3
III	**ANSWER ALL QUESTIONS**				**Marks**	**BT Level**	**CO**
PART – C (15 X 1 = 15 Marks)							
	08.			Multiple Choice Questions https://forms.gle/QncwLVFydrqGHcrv9	15	K1	

Blooms Levels: K1 - Remember, K2 – Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

Faculty In-charge **HOD** **Principal**

Roll Number							

CARE COLLEGE OF ENGINEERING, TRICHY
DEPARTMENT OF MECHANICAL ENGINEERING

CLASS:	:	**II B.E MECHANICAL**	**MAX MARKS**	:	**50**
SEMESTER:	:	**III**	**DURATION**	:	**01.30 Hrs**
SUBJECT:	:	**ENGINEERING THERMODYNAMICS**	**CODE**	:	**ME8391**
COURSE NO	:	**C391**	**DATE**	:	**10.11.2021 FN**
ACADEMIC YEAR	:	**2021 – 22 (ODD)**	**EXAM**	:	**Cycle Test - II**

PART – A (5 X 2 = 10 Marks)				
I	**ANSWER ALL QUESTIONS**		**BT level**	**CO**
	1.	Define the terms boiling point and melting point	K1	C391.3
	2.	Write down the Vander Waals equation of state. How does it differ from the ideal gas equation of state?	K1	C391.4
	3.	What is the effect of regeneration on the cycle efficiency?	K1	C391.3
	4.	What is the difference between real and ideal gases?	K1	C391.4
	5.	What is the fundamental property of gases with respect to the product of p.v?	K1	C391.4

PART – B (2 X 13 = 26 Marks)							
II	**ANSWER ALL QUESTIONS**				**Marks**	**BT Level**	**CO**
	08.	(a)		A steam power plant used steam as working fluid and operates at a boiler pressure of 5 MPa, dry saturated and a condenser pressure of 5 KPa. Determine the cycle efficiency for (i) Carnot cycle (ii) Rankine cycle. Also, show TS representation of both the cycles.	13	K3	C605.3
				(OR)			
		(b)		Explain the working of Reheat Rankine cycle with suitable sketch. And write the merits and demerits.	13	K3	C605.3
	09.	(a)		5 kmol of carbon monoxide (CO) is stored in a 1.135 m^3 container at 215 K. Determine the pressure using (i) ideal gas equation (ii) van der waals equation. The constants in the van der waals equation are 146.3 KPa $m^6/kmol^2$, and 0.0394 $m^3/kmol$.	13	K3	C605.4
				(OR)			
		(b)		Explain the working of regenerative Rankine cycle with suitable sketch. And write the merits and demerits.	13	K3	C605.4
III	**ANSWER ANY ONE QUESTION**				**Marks**	**BT Level**	**CO**
PART – C (14 X 1 = 14 Marks)							

	10	(a)	Define the following terms pertaining to pure substance like water: 1) Sensible heating 2) Latent heating 3) Saturation states 4) Saturation pressure 5) Saturation temperature 6) Triple point 7) Dryness fraction 8) Super-heated steam and Degree of super heat.	14	K3	C605.3
			(OR)			
		(b)	A vessel of capacity 3 m^3 contains 1 kgmol of N_2 at 90 °C. (i) Calculate pressure and specific volume of gas (ii) If the ratio of specific heat is 1.4 evaluate C_p and C_v. (iii) Subsequently the gas cools to the atmospheric temperature of 20 °C, the evaluate the final pressure of gas. (iv) Evaluate increase in specific internal energy, increase in specific enthalpy, increase in specific entropy and magnitude and direction of heat transfer.	14	K3	C605.4

Blooms Levels: K1 - Remember, K2 – Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

Faculty In-charge	**HOD**	**Principal**
Dr. Gobalakrishnan	**Dr. D.R. Rajkumar**	**Dr. S. Shanthi**

Reg. Number												

CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT OF MECHANICAL ENGINEERING

CLASS:	:	**II B.E MECHANICAL**	**MAX MARKS**	:	**100**
SEMESTER:	:	**III**	**DURATION**	:	**3:00 Hrs**
SUBJECT:	:	**Engineering Thermodynamics**	**CODE**	:	**ME8391**
COURSE NO	:	**C391**	**DATE**	:	**26.11.2021**
ACADEMIC YEAR	:	**2021 – 22 (ODD)**	**EXAM**	:	**MODEL**

PART – A (10 X 2 = 20 Marks)

I		ANSWER ALL QUESTIONS	BT level	Course Outcome
	1.	Define concept of continuum?	K1	C391.1
	2.	Distinguish between open and closed system?	K1	C391.1
	3.	What is Heat pump? And COP of Heat pump.	K1	C391.2
	4.	What is reversed Carnot cycle? And why it is not practical.	K1	C391.2
	5.	Define triple point.	K1	C391.3
	6.	Draw the T-S diagram for water and label all salient points.	K1	C391.3
	7.	What is an equation of state?	K1	C391.4
	8.	What is the significance of compressibility factor?	K1	C391.4
	9.	What is the law of corresponding states?	K1	C391.5
	10.	Summarize why humidification of air is necessary.	K1	C391.5

PART – B (5 X 13 = 65 Marks)

II				ANSWER ALL QUESTIONS		BT Level	Course Outcome
	11	(a)	(i)	Briefly explain the following: (i) Illustrate reversible and irreversible process. (ii) Compare intensive and extensive properties. (iii) Compare homogeneous and heterogeneous system.	13	K2	C391.1
				(OR)			
		(b)	(i)	A stationary mass of gas is compressed without friction from an initial state of $0.3m^3$ and 0.015 MPa to the final state of $0.15m^3$ and 0.105MPa, the pressure remaining constant during the process. There is a transfer of 37.6 KJ	13	K3	C391.1

				of heat from the gas during the process. How much does the internal energy of the gas change?			
	12	(a)	(i)	Air flows through as adiabatic compressor at 2 kg/sec. The inlet conditions are 100 KPa and 310 K and the exit conditions are 700 KPa and 560 K. Consider T_0 to be 298 K. Determine the change of availability and irreversibility.	13	K3	C391.2
				(OR)			
		(b)	(i)	Air expands through a turbine from 500 KPa, 520 °C to 100 KPa, 300 °C. During expansion 10 KJ/kg of heat is lost to the surroundings which is at 98 KPa, 20 °C. Neglecting the KE and PE changes, determine power kg of air, (i) the decrease in availability (ii) the maximum work and (iii) the irreversibility. For air Cp = 1.005 KJ/kg K.	13	K3	C391.2
	13	(a)	(i)	Find the specific enthalpy, specific volume, specific internal energy and specific entropy of steam at a pressure of 10 bar when (i) the steam is wet with dryness fraction 0.9 (ii) the steam is dry and saturated (iii) the steam is superheated to 300 °C.	13	K3	C391.3
				(OR)			
		(b)	(i)	Explain the combined gas-vapour cycle with suitable sketch.	13	K3	C391.3
	14	(a)	(i)	One kg of CO_2 has a volume of 1 m^3 at 100 C. Compute the pressure by (i) Van der waals equation (ii) ideal gas equation. The van der waals constants a= 362850 $Nm^4/kg.mol^2$ and b= 0.0423 $m^3/kg.mol$.	13	K3	C391.4
				(OR)			
		(b)	(i)	A steam power plant running on Rankine cycle has steam entering HP turbine at 20 MPa, 500 °C and leaving LP turbine at 90% dryness. Considering condenser pressure of 0.005 MPa and reheating occurring up to the temperature of 500 °C. Determine the pressure at which steam leaves the HP turbine, thermal efficiency and work done.	13	K3	C391.4
	15	(a)	(i)	A certain sample of moist air exists at 35 °C DBT and 20 °C dew point temperature the atmospheric pressure is 760 mm of mercury. Calculate the relative humidity and saturation ratio.	13	K3	C391.5
				(OR)			
		(b)	(i)	Atmospheric air at 1.0132 bar has 20 °C DBT and 65% RH. Find humidity ratio, wet bulb temperature, dew point temperature, degree of saturation, enthalpy of mixture, density of air and density of vapour in the mixture.	13	K3	C391.5

PART – C (1 X 15 = 15 Marks)							
III	**ANSWER ALL QUESTIONS**					**BT Level**	**Course Outcome**
	16	(a)		An internal combustion engine has the following dimensions: Diameter of cylinder = 550 mm; Stroke = 750 mm; Compression ratio = 13.5. At the end of the suction stroke, the pressure is 1 bar and temperature 316 K. The compression follows the law $pv^{1.37} = C$. Determine, a) The pressure and temperature at the end of compression b) The mass of the charge c) The work done during compression d) The heat rejected during compression. Take Cp = 0.99 KJ/kg.K and Cv = 0.707 KJ/kg K	15	K3	C391.1
				(OR)			
		(b)		An office is to be air conditioned for 50 staff when the outdoor conditions are 30 °C and 75% RH, if the quantity of air supplied is 0.4 m^3/min/person, find the following a) Capacity of the cooling coil in tons of refrigeration b) Capacity of the heating coil in KW c) Amount of water vapour removed per hour. d) Assume that required air inlet conditions are 20 °C DBT and 60% RH. Air is conditioned first by cooling and dehumidifying and then by heating. If the heating coil surface temperature is 25 °C find the by-pass factor of the heating coil.	15	K3	C391.5

Blooms Levels: K1 - Remember, K2 – Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

Faculty In-charge **HOD** **Principal**

21/25

1. for an ideal gas from the ideal gas law $PV = NKT$, PV remains constant through an isothermal process A curve in a P-V diagram generated by the equation $PV = const$ is called an isotherm for an isothermal reversible process the work done by gas is equal to the area under the relevant pressure-volume isotherm.

2. Thermodynamic equilibrium condition or state of a thermodynamic system the properties of which do not change with time and that can be changed to another condition only at the expense of effects on other system

3. Point function	Path function
The quantity which is independent on the process or path followed by the system	The quantity dependent on the process or path followed by the system
Example pressure volume temperature etc	Example Heat transfer work transfer etc.

7-9-2021

PRISTAN

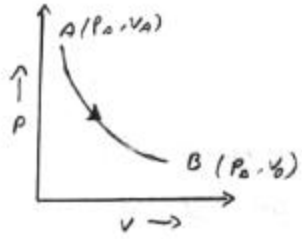
PART - A.

23/25

1) Isothermal Process:

An Isothermal process is a type of thermodynamic process in which the temperature of the system remains constant

$\Delta T = 0$



2. Thermodynamic equilibrium:

* when a system is in thermodynamic equilibrium, it should satisfy the following three conditions
  * mechanical equilibrium - pressure remains constant
  * thermal equilibrium - temperature remains constant
  * chemical equilibrium - there is no chemical reaction.

Differentiate between point function and path function

Point function	Path function
The quantity which is independent on the process or path followed by the system	The quantity dependent on the process or path followed by the system.
Example: pressure, volume, temperature etc.	Example: Heat transfer, work transfer etc.

Unit Test - I

Date: 07/09/21

20/25

Name: Alfahath N

Dept: MECH (B.E) 2nd year

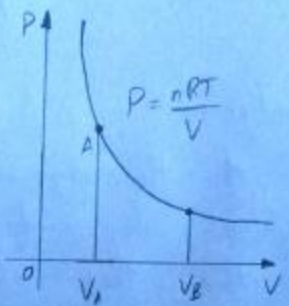
Engineering Thermodynamics

[ME 8391]

Part - A

1) Isothermal process with PV diagram:

An isothermal process is a type of thermodynamic process in which the temperature of the system remains constant: $\Delta T = 0$.



2. Thermodynamics Equilibrium:

A condition or state of a thermodynamic system, the properties of which do not change with time and that can be changed to another condition only at the expense of effects on other systems.

Part-A.

25/50

1) The Flow Energy:

It is the energy associated with the flow of mass across the boundaries of a system.

2) Reversed heat engine:

The reverse heat engine is a device that transfers energy from an object at a lower temperature to an object at a higher temperature by doing work on the system. Refrigerators are reverse heat engines that pump energy out of the inside of the fridge and into the surrounding area by the way of an electric motor

3) Clausius inequality with its expression:

The clausius inequality for a closed system states that the process is irreversible if $Tds > dq$, and the process is reversible if $Tds = dQ$ ... Total entropy change ds: Sum of the changes in internal entropy and external entropy between a system and reservoir.

(1) Flow energy:

It is the energy associated with the flow of mass across the boundaries of a system.

Flow energy = PxV (N-m)

(2) Reverse heat engine:

* The Device that transfer energy from an object at a lower temperature to an object at a higher temperature by doing work on the system.

* Refrigerator are reverse heat engine that Pump energy out of the inside of fridge and into the surrounding area by the way of an electric motor.

(3) Thermal energy reservoir: Clausius Inequality:

The Clausius inequality for a closed system state that the process is irreversible if $\int \frac{\delta Q}{T} > 0$ and the process is reversible if $\int \frac{\delta Q}{T} = 0$. Total entropy change and external entropy between a system and reservoir.

(4) Thermal energy reservoir

Before describing how this conversion occures we must define and important termody namic term. Thermal energy reservoir. A thermal energy reservoir is a body with a very large thermal capacity. A thermal energy source supplies heat to a system. Where a thermal energy sink absorbs heat from a system.

Sub: ME8391 Name: P. Jayaprakash.

PART - A 25/50

1. Flow Energy:

It is the energy associated with the flow of mass across the boundaries of a system

Flow Energy = $P \times V$ (N-m).

2. Reversed heat engine

No reverse heat engine is a device that transfers energy from an object at a lower temperature to an object at a higher temperature by doing work on the system.

3. Clausius inequality with its expression:

No clausius inequality for a closed system states that the process is irreversible if $TdS > dQ$. and the process is reversible if $TdS = dQ$

Total entropy change ds: sum of the changes in internal entropy and external entropy between a system and reservoir.

4. Normal energy reservoir:

A normal energy reservoir is a body with a very large thermal capacity. A normal energy source supplies heat to a system, whereas a normal energy sink absorbs heat from a system.

5. Availability:

No maximum useful work obtained during a process in which the final condition of the system is the same as that of the surrounding is called availability of the system.

18/25

Reg no: 810120114009.

Name : K. Roobar.

PART-A.

1) Exergy (Ex) is defined as the amount of work (= entropy-free energy) a system can perform when it is brought into thermodynamic equilibrium with its environment.
(i.e) $|\Delta A_{max}| = Ex$.

6) A substance of constant chemical composition throughout its mass is called pure substance

Whether is an example of pure substance.

It is one of the three forms namely solid (ice) liquid (water) and gas (water vapour or steam) or. Co exists in two forms.

The steam is very popular in power generation using steam power plant.

The other examples of pure substance are nitrogen, carbon dioxide, argon, air and oxygen.

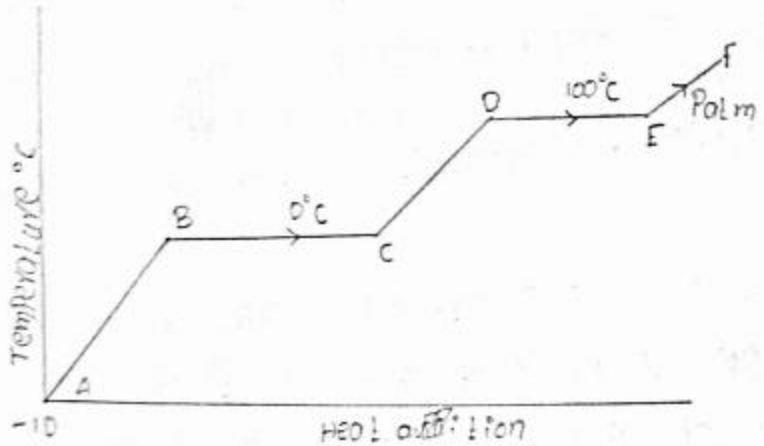
4) Steam can be superheated without applying high pressure.

Compared to heated air superheated steam has a high thermal capacity per unit volume,

PART-B

23/25

7a) Formation of Steam:



Formation of Steam:

Stage A-B: The ice is heated from -10°C to 0°C, the ice is in solid form and the temperature of the increases. The heat added to change the temperature of ice at constant pressure is called as sensible heat of ice.

Stage B-C:

The state B is heated point of ice melting point and the corresponding temperature is called melting or fusion temperature. At point C, it is completely water at 0° and latm pressure. The heat added to convert unit mass of ice form saturation temperature into water at constant pressure and temperature is called as latent heat of fusion. The reverse is called as latent heat of freezing

Joe Berlin B

810720114002

ME8391 - Engineering Thermodynamics.

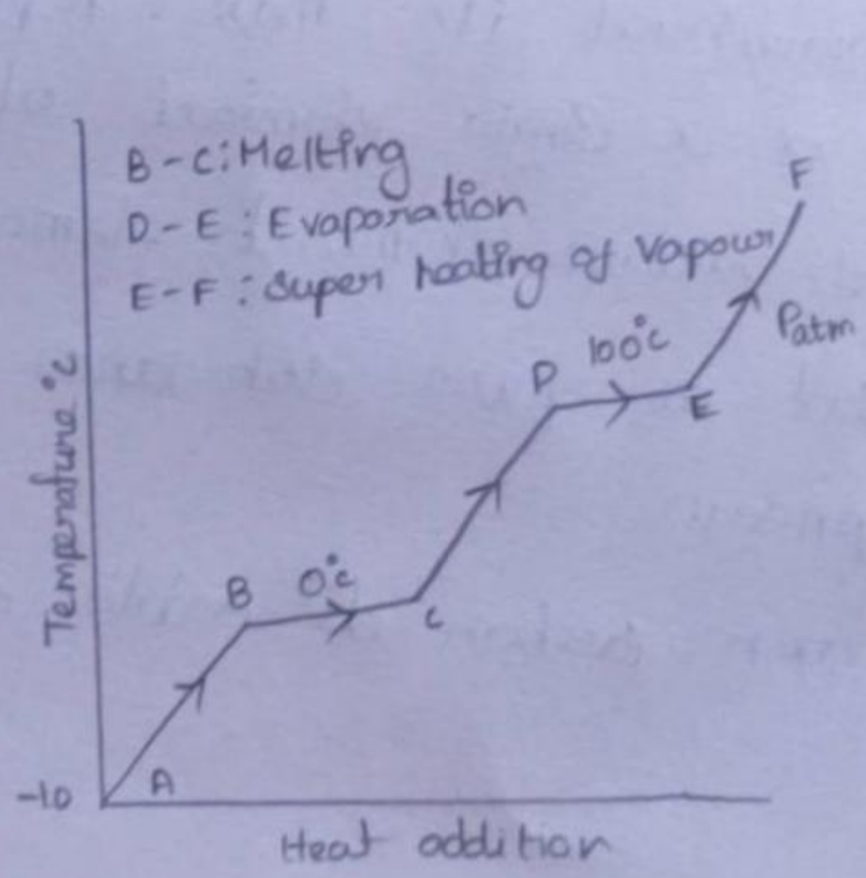
12 / 25

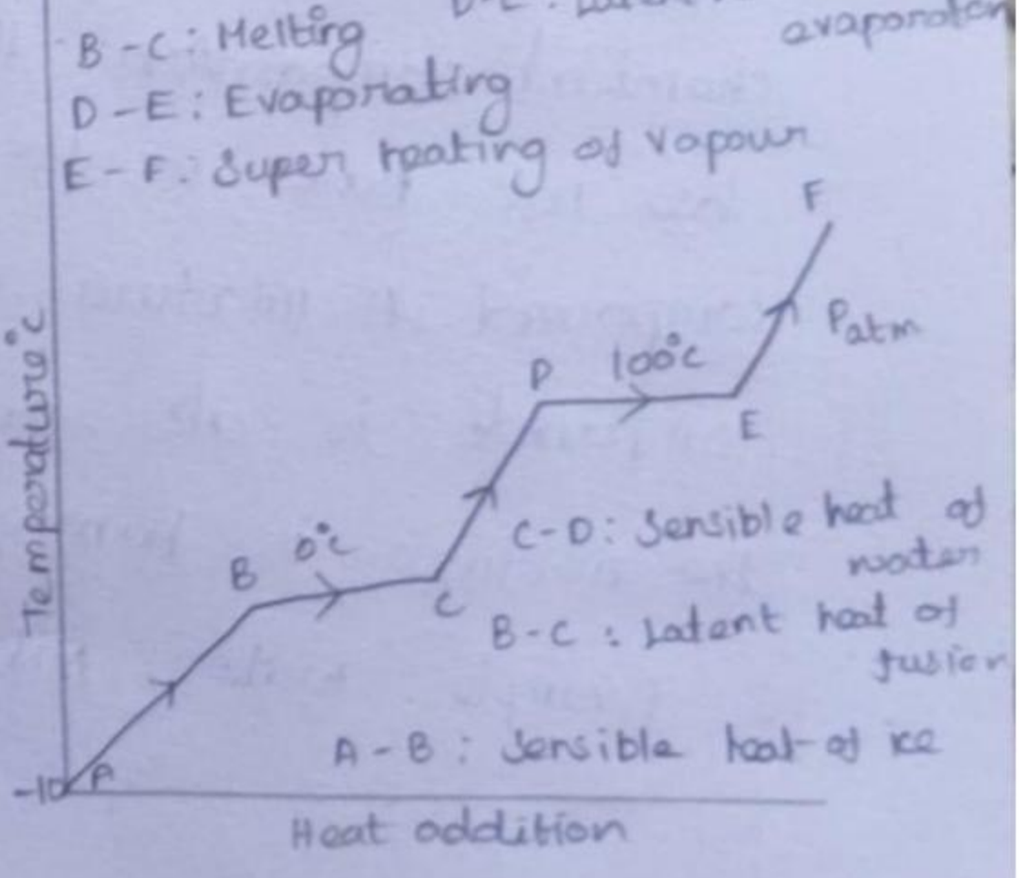
PART-A

1. Exergy is defined as the amount of work a system can perform when it is brought into thermodynamic equilibrium with its environment

$$I = Ex.$$

2.





3. It is the amount by which the water is cooled beyond the saturated temperature at the same as the ratio of the mass of the total steam actually

CARE
COLLEGE OF ENGINEERING
TRICHY – 620009

INTERNAL ASSESSMENT TEST

Reg. No : 8 1 0 7 2 0 1 1 4 0 0 4

College Code Name	8107 - Care college of Engineering		
Student Name	Madeshwaran - P		
Degree / Branch	B.E. MECHANICAL Engineering	Semester	III
Subject Code	ME8391	Date & Session	10.11.2021. FN
Subject Title	Engineering Thermodynamics	No. of Pages used	8

S. Bharath
Chief Superintendent's Signature / Facsimile

All Particulars given are verified
M. Nigneshwaran.
Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book
Put a tick mark (✓) in the applicable Test

UT - I		CT - I		UT - II		CT - II	✓

Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

						i				ii				iii				Total Marks	Grand Total				
Q	✓	CO	BT	Marks	Q		✓	CO	BT	Marks	✓	CO	BT	Marks	✓	CO	BT	Marks		CO 1	CO 2	CO 3	CO 4	CO 5
1	✓	3	K1	2	8	a															-	2	31	
2						b														CO 6	CO 7	CO 8	CO 9	CO 10
3	✓	4	K1	2	9	a	✓	4	K3										13					
4	✓	4	K2	1		b																		
5	✓	4	K1	2	10	a	✓	4	K3										13					
6						b																		
7																								
Total				07															Total 26	33/50				

66 %

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

11/11/2021	B. GOBALAKRISHNAN.	
Date of Valuation	Name of the Examiner	Signature of the Examiner

Yes	P. Madeshwaran
Statement of student stating all Comments/ Corrections noted	Signature of the Candidate

CARE
COLLEGE OF ENGINEERING
TRICHY – 620009

INTERNAL ASSESSMENT TEST

Reg. No : B L 2 0 M E 3 0 2

College Code Name	8107 Care College of Engineering		
Student Name	S. Manikaran		
Degree / Branch	BE Mechanical Engineering	Semester	III
Subject Code	ME 8391	Date & Session	10/11/21 FN
Subject Title	Engineering Thermodynamics	No. of Pages used	08

S. Bhatt
Chief Superintendent's Signature / Facsimile

All Particulars given are verified
M. Vignesharan.
Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book
Put a tick mark (✓) in the applicable Test

UT - I		CT - I		UT - II		CT - II	✓

Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

							I					II					III				Total Marks	Grand Total				
Q	✓	CO	BT	Marks	Q		✓	CO	BT	Marks	✓	CO	BT	Marks	✓	CO	BT	Marks		CO 1	CO 2	CO 3	CO 4	CO 5
1					8	a																2	27	
2						b														CO 6	CO 7	CO 8	CO 9	CO 10
3	✓	4	K3	2	9	a	✓	4	K3	·									13					
4						b																		
5					10	a																		
6						b	✓	4	K3										14					
7																								
Total				02														Total	27					

29/50
58%

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

11/11/2021	B. GOBALAKRISHNAN.	
Date of Valuation	Name of the Examiner	Signature of the Examiner

Yes	S. Manikaran
Statement of student stating all Comments/ Corrections noted	Signature of the Candidate

CARE

COLLEGE OF ENGINEERING
TRICHY – 620009

INTERNAL ASSESSMENT TEST

Reg. No: B 1 2 0 M C 3 1 1

College Code Name	Care College of engineering		
Student Name	S. Rishikumar	Semester	III
Degree / Branch	BE / Mech	Date & Session	10/11/23 FN
Subject Code	ME8391	No. of Pages used	5
Subject Title	Engineering Thermodynamics		

S. Bharath

Chief Superintendent's Signature / Facsimile

All Particulars given are verified

10/11/23

Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book

Put a tick mark (✓) in the applicable Test

UT - I		CT - I		UT - II		CT - II	

Instruction to the Candidate: Put (✓) for the questions attended in the tick mark column against each question

						I					II					III				Total Marks	Grand Total				
Q	✓	CO	BT	Marks	Q		✓	CO	BT	Marks	✓	CO	BT	Marks	✓	CO	BT	Marks		CO 1	CO 2	CO 3	CO 4	CO 5
1	✓	3	K1	2	8	a																2	8	
2						b														CO 6	CO 7	CO 8	CO 9	CO 10
3	✓	3	K1	2	9	a	✓	4	K3										6					
4						b																		
5					10	a																		
6						b																		
7																								
Total				04															Total	66				

10/50

20%

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

11/11/2023	B. GOBALAKRISHNAN	
Date of Valuation	Name of the Examiner	Signature of the Examiner

Yes	S. Rishikumar.
Statement of student stating all Comments/ Corrections noted	Signature of the Candidate

CARE
COLLEGE OF ENGINEERING
TRICHY – 620009

MODEL EXAMINATION

Reg. No : 8 1 0 7 2 0 1 1 4 0 0 7

College Code Name	8107 / CARE COLLEGE OF ENGINEERING		
Student Name	NARESH PRABHU.P	Semester	3rd
Degree / Branch	B.E / MECHANICAL	Date & Session	30.11.21/AN
Subject Code	ME8391	No. of Pages used	3
Subject Title	ENGINEERING THERMODYNAMICS		

Chief Superintendent's Signature/ Facsimile

All Particulars given are verified

30/11/2021

K. RUBITHA
Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book
Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

Q	✓	CO	BT	Marks	Q		I ✓	I CO	I BT	I Marks	II ✓	II CO	II BT	II Marks	III ✓	III CO	III BT	III Marks	Total Marks
1					11	a													
2						b													
3					12	a													
4						b													
5					13	a													
6						b													
7					14	a	✓	4	K6	2									
8						b													
9					15	a													
10						b	✓	5	K4	5									
					16	a													
						b	✓	5	K6	12									
Total																	Total		

CO 1	CO 2	CO 3	CO 4	CO 5
6	0	6	2	16

CO 6	CO 7	CO 8	CO 9	CO 10

Grand Total: 20 %

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

Date of Valuation	Name of the Examiner	Signature of the Examiner
01/12/2021	B. GOBALAKRISHNAN	

Statement of student stating all Comments/ Corrections noted	Signature of the Candidate
Yes	

CARE
COLLEGE OF ENGINEERING
TRICHY – 620009

MODEL EXAMINATION

Reg. No : B L 2 0 M E 3 0 2

College Code Name	8107 CARE COLLEGE OF ENGINEERING		
Student Name	S. HARIHARAN		
Degree / Branch	BE MECHANICAL	Semester	II
Subject Code	ME 8391	Date & Session	30/11/21 AN
Subject Title	Engineering Thermodynamics	No. of Pages used	13

S. Hari
Chief Superintendent's Signature/ Facsimile

All Particulars given are verified
30/11/2021
K. RUBITHA
Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book
Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

Q	✓	CO	BT	Marks	Q		✓	CO	BT	Marks	✓	CO	BT	Marks	✓	CO	BT	Marks	Total Marks
							i				ii				iii				
1	✓	1	K1	2	11	a													
2	✓	1	K2	1		b													
3	✓	2	K2	2	12	a													
4						b	✓	2	K3	13									13
5					13	a	✓	3	K3	13									13
6	✓	3	K3	1		b													
7	✓	4	K2	2	14	a	✓	4	K4	13									13
8	✓	4	K1	1		b													
9					15	a													
10	✓	5	K3	2		b													
					16	a													
						b	✓	5	K4	15									15
Total				11														Total	54

CO 1	CO 2	CO 3	CO 4	CO 5
3	15	14	16	17
CO 6	CO 7	CO 8	CO 9	CO 10

Grand Total: 65 %

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

Date of Valuation	Name of the Examiner	Signature of the Examiner
01/12/2021	B. GOBALAKRISHNAN.	

Statement of student stating all Comments/ Corrections noted	Signature of the Candidate
Yes	S. Hariharan

CARE

COLLEGE OF ENGINEERING

TRICHY – 620009

MODEL EXAMINATION

Reg. No : 8 1 0 7 8 0 1 1 4 0 0 4

College Code Name	8107 care college of Engineering		
Student Name	P. Madeshwaran		
Degree / Branch	B.E / MECHANICAL ENGINEERING	Semester	III
Subject Code	ME8391	Date & Session	30.11.21 / FN
Subject Title	Engineering Thermodynamics	No. of Pages used	13

S. Shanthi

Chief Superintendent's Signature/ Facsimile

All Particulars given are verified

K. Durga 30/11/2021

K. DURGA

Name of the Hall Superintendent

Do not write the Register Number, Roll Number, College Code and the Name in any other part of the Answer Book

Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

Q	✓	CO	BT	Marks	Q		✓	CO	BT	Marks	✓	CO	BT	Marks	✓	CO	BT	Marks	Total Marks
		I					I				II				III				
1	✓	1	K1	2	11	a	✓	4	K3	13									13
2	✓	1	K2	2		b													
3	✓	2	K3	2	12	a													
4	✓	2	K3	2		b													
5	✓	3	K3	2	13	a													
6						b	✓	3	K4	13									13
7	✓	4	K2	2	14	a													
8	✓	4	K1	2		b													
9					15	a													
10	✓	5	K3	2		b													
					16	a													
						b	✓	5	K4	15									15
Total				16														Total	41

Grand Total				
CO 1	CO 2	CO 3	CO 4	CO 5
17	4	15	4	17
CO 6	CO 7	CO 8	CO 9	CO 10

57 / verified

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

Date of Valuation	Name of the Examiner	Signature of the Examiner
01/12/2021	B. GOBALAKRISHNAN	

Statement of student stating all Comments/ Corrections noted	Signature of the Candidate
YES	P. Madesh

Roll Number												

CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT OF MECHANICAL ENGINEERING

CLASS:	:	**II B.E MECHANICAL**	**MAX MARKS**	:	**70 Marks**
SEMESTER:	:	**III**	**DURATION**	:	**02.00 Hrs**
SUBJECT:	:	**Engineering Thermodynamics**	**CODE**	:	**ME8391**
COURSE NO	:	**C391**	**DATE**	:	**10.12.2021**
ACADEMIC YEAR	:	**2021 – 22 (ODD)**	**EXAM**	:	**Additional Unit Test 1**

PART – A (9 X 2 = 18 Marks)				
I	**ANSWER ALL QUESTIONS**		**BT level**	**CO**
	1.	Explain Isothermal process with PV diagram	K1	C391.1
	2.	Summarize thermodynamic equilibrium.	K1	C391.1
	3.	Differentiate between point function and path function.	K1	C391.1
	4.	Define Zeroth Law of thermodynamics. Why it is so called?	K1	C391.1
	5.	State the first law for a closed system undergoing a process and a cycle.	K1	C391.1
	6.	Define Second law of thermodynamics	K1	C391.1
	7.	What is Heat pump? And COP of Heat pump.	K1	C391.2
	8.	What is Refrigerator? And COP of Refrigerator.	K1	C391.2
	9.	Define the available energy with examples.	K1	C391.2

PART – B (4 X 13 = 52 Marks)							
II	**ANSWER ALL QUESTIONS**				**Marks**	**BT Level**	**CO**
	10.	(a)		Derive the steady flow energy equation and reduce it for a Turbine, pump, nozzle and a heat exchanger.	13	K3	C391.1
				(OR)			
		(b)		A vessel of capacity 3 m^3 contains air at a pressure of 1.5 bar and a temperature of 25°C. Additional air is now pumped into the system until the pressure rises to 30 bar and temperature rises to 60°C. Determine the mass of air pumped in and express the quantity as a volume at a pressure of 1.02 bar and a temperature of 20°C. if the vessel is allowed to cool until the temperature is again 25°C, calculate the pressure in the vessel.	13	K4	C391.1
	11	(a)		A stationary mass of gas is compressed without friction from an initial state of 0.3m3 and 0.015 MPa to the final state of 0.15m3 and 0.105MPa, the pressure remaining constant during the process. There is a transfer of 37.6kJ of heat from the gas during the process. How much does the internal energy of the gas change?	13	K4	C391.1
				(OR)			
		(b)		Briefly explain the following: (i) Illustrate reversible and irreversible process. (ii) Compare intensive and extensive properties. (iii) Compare homogeneous and heterogeneous system.	13	K4	C391.1
	12	(a)		Air expands through a turbine from 500 KPa, 520 °C to 100 KPa, 300 °C. During expansion 10 KJ/kg of heat is lost to the surroundings which is at 98 KPa, 20 °C. Neglecting the KE and PE changes, determine power kg of air, (i) the decrease in availability (ii) the maximum work and (iii) the	13	K4	C391.1

				irreversibility. For air $C_p = 1.005$ KJ/kg K.			
				(OR)			
		(b)		A system contains 0.15 m3 of a gas at a pressure of 3.8 bar and 150°C. It is expanded adiabatically till the pressure falls to 1 bar. The gas is then heated at a constant pressure till its enthalpy increases by 70 KJ. Determine the total work done. Take $C_p = 1$KJ/kg K and $C_v = 0.714$ KJ/kg K.	13	K4	C391.1
	13	(a)		The food compartment of a refrigerator is maintained at 4°C by removing heat from it at a rate of 360 KJ/min. If the required power input to the refrigerator is 2KW, draw a block diagram and determine: 1. The Coefficient of performance of the refrigerator. 2. The rate of heat rejection to the room that houses the refrigerator.	13	K4	C391.2
				(OR)			
		(b)		A heat pump is used to meet the heating requirement of a house and maintain it 20°C. On a day when the outdoor air temperature drops to 2°C, the house is estimated to lose heat at a rate of 80,000 KJ/hr. If the heat pump under these conditions has a COP of 2.5, determine the power consumed by the heat pump in KW. Compare COP heat pump if it works on Carnot principle between the same temperature limits.	13	K4	C391.2

Blooms Levels: K1 - Remember, K2 – Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

Faculty In-charge
Dr. B. Gobalakrishnan

HOD
Dr. D.R. Rajkumar

Principal
Dr. S. Shanthi

Roll Number												

CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT OF MECHANICAL ENGINEERING

CLASS:	:	**II B.E MECHANICAL**	**MAX MARKS**	:	**70 Marks**
SEMESTER:	:	**III**	**DURATION**	:	**02.00 Hrs**
SUBJECT:	:	**Engineering Thermodynamics**	**CODE**	:	**ME8391**
COURSE NO	:	**C391**	**DATE**	:	**20.12.2021**
ACADEMIC YEAR	:	**2021 – 22 (ODD)**	**EXAM**	:	**Additional Unit Test 2**

PART – A (9 X 2 = 18 Marks)				
I	**ANSWER ALL QUESTIONS**		**BT level**	**CO**
	1.	State the Kelvin Planck statement of second law of thermodynamics?	K1	C391.2
	2.	State the Clausius statement of second law of thermodynamics?	K1	C391.2
	3.	State Carnot's theorem and its corollaries.	K1	C391.2
	4.	Define the term COP? Write the formulae for refrigerator & heat pump.	K1	C391.2
	5.	What is super-heated steam? Define degree of superheat and heat of superheat.	K1	C391.3
	6.	What is critical state?	K1	C391.3
	7.	What is sensible heat?	K1	C391.3
	8.	What is latent heat?	K1	C391.3
	9.	Define triple point and identify the triple point of water.	K1	C391.3

PART – B (4 X 13 = 52 Marks)							
II	**ANSWER ALL QUESTIONS**				**Marks**	**BT Level**	**CO3**
	10.	(a)		Two reversible heat engines A and B are arranged in series. Engine A rejecting heat directly to engine B, receives 200 kJ at a temperature of 421°C from a hot source, while engine B is in communication with a cold sink at a temperature of 4.4°C. If the work output of A is twice that of B, find a) The intermediate temperature between A and B b) The efficiency of each engine and c) The heat rejected to the cold sink.	13	K3	C391.2
				(OR)			
		(b)		Air expands through a turbine from 500 KPa, 520 °C to 100 KPa, 300 °C. During expansion 10 KJ/kg of heat is lost to the surroundings which is at 98 KPa, 20 °C. Neglecting the KE and PE changes, determine power kg of air, (i) the decrease in availability (ii) the maximum work and (iii) the irreversibility. For air Cp = 1.005 KJ/kg K.	13	K4	C391.2
	11	(a)		Air flows through as adiabatic compressor at 2 kg/sec. The inlet conditions are 100 KPa and 310 K and the exit conditions are 700 KPa and 560 K. Consider T_0 to be 298 K. Determine the change of availability and irreversibility.	13	K4	C391.2
				(OR)			

		(b)		A reversible heat engine operates between two reservoirs at 600 °C and 40 °C. Engine drives a reversible refrigerator which operates between reservoirs at temperatures of 40 °C and –20°C. The heat transfer to the engine is 2000 KJ and network available for the combined cycle is 360 KJ. a) Calculate the heat transferred to the refrigerant b) The net heat transfer to the reservoir at 40°C.	13	K4	C391.2
	12	(a)		With the help of a schematic diagram, explain the regenerative Rankine cycle and derive the expression for its efficiency. Also represent the process in p-v and T-s diagram.	13	K4	C391.3
				(OR)			
		(b)		Find the specific enthalpy, specific volume, specific internal energy and specific entropy of steam at a pressure of 10 bar when (i) the steam is wet with dryness fraction 0.9 (ii) the steam is dry and saturated (iii) the steam is superheated to 300 °C.	13	K4	C391.3
	13	(a)		Define the following terms pertaining to pure substance like water: 1) Sensible heating 2) Latent heating 3) Saturation states 4) Saturation pressure 5) Saturation temperature 6) Triple point 7) Dryness fraction 8) Super-heated steam and Degree of super heat.	13	K4	C391.3
				(OR)			
		(b)		A steam power plant used steam as working fluid and operates at a boiler pressure of 5 MPa, dry saturated and a condenser pressure of 5 KPa. Determine the cycle efficiency for (i) Carnot cycle (ii) Rankine cycle. Also, show TS representation of both the cycles.	13	K4	C391.3

Blooms Levels: K1 - Remember, K2 – Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

Faculty In-charge
Dr. B. Gobalakrishnan

HOD
Dr. D.R. Rajkumar

Principal
Dr. S. Shanthi

CARE

COLLEGE OF ENGINEERING

(Approved by AICTE and Affiliated to Anna University, Chennai)
27, Thayanur, Trichy – 620009

Unit, Cycle Test and Model Exam (IA) failed students Root Cause Analysis

SUBJECT INFORMATION

PROGRAMME: **Mechanical Engineering**	DEGREE: **B.E.**
COURSE: **Engineering Thermodynamics**	SEMESTER: III CREDITS: **04**
COURSE CODE: **ME8391** REGULATION: **R 2017**	COURSE TYPE: **CORE**
COURSE AREA/DOMAIN: **Thermal Engineering**	CONTACT HOURS: 5 **hours/Week.**
TOTAL NO. OF STUDENTS: **- 20**	AVERAGE NO OF FAILED STUDENTS IN ALL EXAMS: **17**

S.no	Problems raised by the students & faculty perspective	Remedies taken by the department
1	First three units were cover by on-line made, hence students not properly understood the concepts.	Revision classes have been conducted for the first three units.
2	Students were not understood some technical concepts by the PPT & black board teaching methods	Based on the student's feedback, the same topics were explained by the animated videos and real-life examples.
3	Faculties were complete the entire syllabus quite fast, Hence, students not able to follow all the topics.	Additional coaching classes have been arranged and clarify the students doubts.
4	Hard copy of the subject note was not given	Based on the student's feedback, hard copy of the subject notes given.
5	Due to heavy rain fall, students would not able to attend classes properly.	Usual class time (9.00 AM – 4.00 PM) has been extended one hour (9.00 AM – 5.00 PM) to improve the teaching learning process.
6	Some of the students were suffered by health issues due to climate changes, hence, they were not attending the classes regularly.	Those students were identified and special classes have been conducted to enhance their subject knowledge.

Note: The above said remedies have been implemented and some additional tests were conducted. Based on the results analysis of the additional tests, it was noticed that, the pass percentage has been enhanced significantly. The evidences were attached in the criterion 1.1.2.

Faculty In-charge
Dr. B. Gobalakrishnan

HOD
Dr. D.R. Rajkumar

CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT: Mechanical Engineering

Unit Test I and Cycle Test I Analysis

R2017: COURSE CODE & NAME: ME8391 Engineering Thermodynamics

FACULTY NAME: Dr.B.Gobalakrishnan

QUESTION SECTION			UT-I – PART A						UT-I – PART B					CT-I – PART A							CT-I – PART B									Others			
QUESTION NUMBER			Q1	Q2	Q3	Q4	Q5	Q6	Q7 (a) (i)	Q7 (a) (ii)	Q7 (b) (i)	Q7 (b) (ii)	Others	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8 (a) (i)	Q8 (a) (ii)	Q8 (b) (i)	Q8 (b) (ii)	Q9 (a) (i)	Q9 (a) (ii)	Q9 (b) (i)	Q9 (b) (ii)	Others	Assignment / Aptitude Test / Seminar / Quiz / Mini Project	Total CT I	Total UT I	Total
ALLOTTED MARKS			2	2	2	2	2	2	13			13	14	2	2	2	2	2	2	2	13			13			13			14			
COURSE OUTCOME			1	1	1	2	2	3	3			3	3	1	2	2	2	2	2	3	3			3			3			3		30%	67%	100
BT LEVELS (R,U,AP,AN,E,C)			U	U	R	U	R	R	U			AN	R	R	R	R	R	R	U	U	R			R			R			R				
S.No	Reg. Number	STUDENT NAME																																
1	810720114002	Joe Berlin B	2	2	2	2	2	2	2			9	12	2	2	2	2	2	2	9							13	9		68	76	80
2	810720114003	Karthikeyan R																													0	0	0
3	810720114004	Madeshwaran P	2	2	2	2	2	2	2			9	12	2	2	2	2	2	2	7							13	9		68	80	83
4	810720114007	Naresh Prabhu P	2	2	2	2	2	2	2			9	12	2	2	2	2	2	2	13							13	9		68	81	85
5	810720114008	Pristan Rajkumar A	2	2	2	2	2	2	2			7	11	2	2	2	2	2	2	9							13	9		68	80	71
6	810720114009	Roshan K												2	2	2	2	2	2	9							13	9		68	81	23
7	810720114310	Alfahath N	2	2	2	2	2	2	2			9	12	2	2	2	2	2	2	9							13	9		68	80	90
8	810720114302	Hariharan S																													0	0	0
9	810720114303	Hariram T	2	2	2	2	2	2	2			9	13	2	2	2	2	2	2	13							13	9		68	90	91
10	810720114304	Jayaprakash P	2	2	2	2	2	2	2			9	13	2	2	2	2	2	2	13							13	9		68	90	74
11	810720114305	Karthikraj N												2	2	2	2	2	2	13							13	9		68	91	61
12	810720114307	Madhavan A	2	2	2	2	2	2	2			10	10	2	2	2	2	2	2	12							13	9		68	91	91
13	810720114308	Prabakaran S	2	2	2	2	2	2	2			10	8	2	2	2	2	2	2	10							13	7		68	88	85
14	810720114310	Pudin Antony A.H	2	2	2	2	2	2	2			9	11	2	2	2	2	2	2	10							3	9		68	88	72
15	810720114311	Ragul Raja S																													0	0	0
16	810720114312	Ragunath P																													0	0	0
17	810720114313	Rayon Mathews R																													0	0	0
18	810720114314	Rishikumar S																													0	0	0
19	810720114316	Tharunsh M	2	2	2	2	2	2	2			7	12	2	2	2	2	2	2	7							13	9		68	80	81
20	810720114317	Udhayanithi K	2	2	2	2	2	2	2			9	12	2	2	2	2	2	2	11							13	9		68	91	90
			CO						CO					CO							CO									CO				
		CO NUMBER	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	8	9	9	9	9	9	9
		BT LEVELS	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C

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CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT : Mechanical Engineering

Unit Test I and Cycle Test I ANALYSIS

R2017: COURSE CODE & NAME: ME8391 Engineering Thermodynamics

FACULTY NAME : Dr.B.Gobalakrishnan

QUESTION SECTION			CO1									CO2									TOTAL
BY LEVELS (R,U,AP,AN,E,C)			R	U	AP	AN	E	C	SCORED	ATTAINED	TARGET	R	U	AP	AN	E	C	SCORED	ATTAINED	TARGET	
S.No.	Reg Number	STUDENT NAME																			
1	[illegible]	Joe Berlin B	22	0	0	0	0	0	44	79	61	27	2	0	0	0	0	29	55	60	73
2	[illegible]	Karthikeyan R	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0
3	[illegible]	Madeshwaran P	22	0	0	9	7	0	46	79	66	27	2	0	0	0	0	29	55	60	75
4	[illegible]	Naresh Prabhu P	26	0	0	9	11	0	50	79	71	25	2	0	0	0	0	27	55	52	77
5	[illegible]	Prabin Rajkumar A	22	0	0	7	0	0	38	79	51	25	4	0	0	0	0	29	55	55	67
6	[illegible]	Rooban K	4	0	0	0	0	0	4	17	23	18	4	0	0	0	0	24	55	43	38
7	[illegible]	Allwinh N	22	0	0	0	0	0	36	67	53	40	4	0	0	0	0	44	46	96	80
8	[illegible]	Hariharan S	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0
9	[illegible]	Hariram T	22	0	0	0	11	0	48	79	70	28	2	0	0	0	0	32	55	57	82
10	[illegible]	Jayaprakash P	22	0	0	9	0	0	39	67	60	27	2	0	0	0	0	29	55	55	68
11	[illegible]	Karthikraj N	4	0	0	0	11	0	36	17	51	27	4	0	0	0	0	31	55	54	67
12	[illegible]	Madhavan A	26	0	0	16	11	0	50	79	71	27	4	0	0	0	0	31	55	54	81
13	[illegible]	Prabakaran S	18	0	0	16	16	0	48	79	66	26	4	0	0	0	0	30	55	55	78
14	[illegible]	Pudin Antony A H	22	0	0	0	16	0	47	79	67	17	2	0	0	0	0	29	55	50	66
15	[illegible]	Ragul Raja S	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0
16	[illegible]	Ragunath P	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0
17	[illegible]	Rayon Mathews R	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0
18	[illegible]	Rishikumar S	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0
19	[illegible]	Thanush M	22	0	0	7	7	0	44	79	61	27	2	0	0	0	0	29	55	55	73
20	[illegible]	Udhayanidhi K	22	0	0	9	11	0	50	79	71	27	4	0	0	0	0	31	55	54	81
	No of Students Attended		0	0	0	0	0	0	20	20	20	20	20	20	20	20	20	20	20	20	

S.No.	CO3									CO4									CO5									CO6									CO7									CO8									CO9								
	R	U	AP	AN	E	C	SCORED	ATTAINED	TARGET	R	U	AP	AN	E	C	SCORED	ATTAINED	TARGET	R	U	AP	AN	E	C	SCORED	ATTAINED	TARGET	R	U	AP	AN	E	C	SCORED	ATTAINED	TARGET	R	U	AP	AN	E	C	SCORED	ATTAINED	TARGET	R	U	AP	AN	E	C	SCORED	ATTAINED	TARGET	R	U	AP	AN	E	C	SCORED	ATTAINED	TARGET
1	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
2	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
3	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
4	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
5	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
6	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
7	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
8	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
9	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
10	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
11	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
12	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
13	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
14	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
15	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
16	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
17	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
18	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
19	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
20	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	0	####	0	0	0	0	0	0	0	####	####
No of Students Attended	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20

ATTAINMENT LEVEL :	55								
CO	1	2	3	4	5	6	7	8	9
Attainment %	60	65	0	0	0	0	0	0	0

L1	60% STUDENTS SCORING MORE THAN SET TARGET (CLASS AVERAGE / PERCEN
L2	70% STUDENTS SCORING MORE THAN SET TARGET (CLASS AVERAGE / PERCENTAGE)
L3	80% STUDENTS SCORING MORE THAN SET TARGET (CLASS AVERAGE / PERCENTAGE)

Course Outcomes	Attainment	P_[illegible]
CO1	60	1
CO2	65	1
CO3	0	0
CO4	0	0
CO5	0	0
CO6	0	0
CO7	0	0
CO8	0	0
CO9	0	0

Faculty In-charge
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HOD
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CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT :

Unit Test II and Cycle Test II Analysis

R2017: COURSE CODE & NAME: ME8391 Engineering Thermodynamics

FACULTY NAME: Dr.B.Gobalakrishnan

QUESTION SECTION	UT.II -- PART A						UT.II -- PART B						CT.II -- PART A							CT.II -- PART B																		
QUESTION NUMBER	Q1	Q2	Q3	Q4	Q5	Q6	Q7 (a) (4)	Q7 (a) (8)	Q7 (b) (8)	Q7 (b) (8)	Others		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8 (a) (4)	Q8 (a) (8)	Q8 (b) (8)	Q8 (b) (8)	Q9 (a) (4)	Q9 (a) (8)	Q9 (b) (8)	Q9 (b) (8)	Q10 (a) (4)	Q10 (a) (8)	Q10 (b) (8)	Q10 (b) (8)	Assignment / Quizzes / Tutorial / Quiz / Mini	Total UT2	Total CT2	Total
ALLOTTED MARKS	2	2	2	2	2	2	13			13		10	2	2	2	2	2			13		13		13		13		14		14			80	80	100
COURSE OUTCOME	3	3	3	3	3	3	3			3		3	3	3	4	4	4			4		4		4		4		3		4			35%	45%	
BT LEVELS (R,U,AP,AN,E,C)	U	U	R	U	R	R	U			AN		R	R	R	U	R	R			AN		AN		AN		AN		AN		AN					

S.No	Reg Number	STUDENT NAME																																			
1	810720114002	Joe Berlin B	2	2	2	2	2	2	0			0		13	2	2	0	0	2			13											63	38	47
2	810720114003	Karthikeyan R																															0	0	0
3	810720114004	Madeshwaran P	2	2	2	2	2	2	11					14	2	0	2	1	2			13				13							93	66	75
4	810720114007	Naresh Prabhu P	2	2	2	2	2	2	12					13	2	0	0	2	2														93	12	40
5	810720114008	Pristan Rajkumar A	2	2	2	2	2	2	0			0		14																			63	0	23
6	810720114009	Rooban K	2	0	0	2	2	2	10					13	1	1	1	1	1			1											79	12	35
7	810720114301	Aflahath N	2	2	2	2	2	2	13					14																			98	0	34
8	810720114302	Hariharan S													0	0	2	0	0			13				14							0	98	38
9	810720114303	Hariram T	2	2	2	2	2	2	11					12																			59	0	31
10	810720114304	Jayaprakash P	2	0	2	2	2	2	10					14																			93	0	30
11	810720114305	Karthikraj N	2	0	2	2	2	2	11					14																			93	0	32
12	810720114307	Madhavan A	2	2	2	2	2	0	11					14																			93	0	32
13	810720114309	Prabakaran S	2	0	2	2	2	2	11					14																			93	0	32
14	810720114310	Pudin Antony A H	2	2	2	2	2	2	12					14																			93	0	33
25	810720114311	Ragul Raja S																															0	0	0
16	810720114312	Ragunath P																															0	0	0
17	810720114313	Rayon Mathews R																															0	0	0
18	810720114314	Rishikumar S	2	2	2	2	2	2	11					14	2	0	2	0	0			0											93	30	45
19	810720114316	Thanush M	2	0	2	2	2	2	11					13																			90	0	32
20	810720114317	Udhayanithi K	2	2	2	2	2	2	11					14																			93	0	32
			CO						CO						CO							CO											CO			CO			CO		
		CO NUMBER	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4	4	4	4	5	5	5	5	5	5	6	6	6	6	7	7	7	7	7	7	8	8	8	8	8	8	9	9	9	9	9	9
		BT LEVELS	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C

Faculty In-charge
Dr. B. Gobalakrishnan

HOD
Dr. D.R. Rajkumar

CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT : Mechanical Engineering

Unit Test II and Cycle Test II Analysis

R2017: COURSE CODE & NAME: ME8391 Engineering Thermodynamics

FACULTY NAME: Dr.B.Gobalakrishnan

QUESTION SECTION / BY LEVELS (R,U,AP,AN,E,C)

S.No.	Reg Number	STUDENT NAME	CO1 R	CO1 U	CO1 AP	CO1 AN	CO1 E	CO1 C	CO1 SCORED	CO1 ALLOTTED	CO1 TARGET	CO2 R	CO2 U	CO2 AP	CO2 AN	CO2 E	CO2 C	CO2 SCORED	CO2 ALLOTTED	CO2 TARGET	CO3 R	CO3 U	CO3 AP	CO3 AN	CO3 E	CO3 C	CO3 SCORED	CO3 ALLOTTED	CO3 TARGET
1	[illegible]	Joe Berlin B	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	28	a	a	a	a	a	28	40	70
2	[illegible]	Karthikeyan R	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
3	[illegible]	Madeshwaran P	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	22	27	a	3	a	a	52	60	87
4	[illegible]	Naresh Prabhu P	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	21	18	a	a	a	a	39	40	98
5	[illegible]	Pristan Rajkumar A	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	29	a	a	a	a	a	29	40	73
6	[illegible]	Rooban K	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	19	14	a	a	a	a	33	40	83
7	[illegible]	Afsharh N	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	28	22	a	a	a	a	50	40	98
8	[illegible]	Hariharan S	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	14	a	a	14	18	78
9	[illegible]	Hariram T	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	18	17	a	a	a	a	35	40	88
10	[illegible]	Jayaprakash P	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	18	16	a	a	a	a	34	40	85
11	[illegible]	Karthikraj N	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	20	17	a	a	a	a	37	40	93
12	[illegible]	Madhavan A	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	18	19	a	a	a	a	37	40	93
13	[illegible]	Prabakaran S	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	20	17	a	a	a	a	37	40	93
14	[illegible]	Pudin Antony A H	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	20	18	a	a	a	a	38	40	95
15	[illegible]	Ragul Raja S	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
16	[illegible]	Ragunath P	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
17	[illegible]	Rayon Mathew R	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
18	[illegible]	Rishikumar S	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	10	17	a	a	a	a	27	40	68
19	[illegible]	Tharush M	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	19	17	a	a	a	a	36	40	90
20	[illegible]	Udhayanidhi K	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	20	17	a	a	a	a	37	40	93
	No of Students Attended		20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20

S.No.	CO4 R	CO4 U	CO4 AP	CO4 AN	CO4 E	CO4 C	CO4 SCORED	CO4 ALLOTTED	CO4 TARGET	CO5 R	CO5 U	CO5 AP	CO5 AN	CO5 E	CO5 C	CO5 SCORED	CO5 ALLOTTED	CO5 TARGET	CO6 R	CO6 U	CO6 AP	CO6 AN	CO6 E	CO6 C	CO6 SCORED	CO6 ALLOTTED	CO6 TARGET
1	2	a	a	13	a	a	15	19	79	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
2	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
3	3	2	a	13	a	a	18	19	95	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
4	4	a	a	a	a	a	4	a	67	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
5	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
6	2	1	a	1	a	a	4	19	21	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
7	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
8	a	2	a	13	a	a	15	19	79	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
9	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
10	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
11	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
12	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
13	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
14	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
15	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
16	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
17	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
18	a	2	a	a	a	a	0	19	47	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
19	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
20	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####
No of Students Attended	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20

S.No.	CO7 R	CO7 U	CO7 AP	CO7 AN	CO7 E	CO7 C	CO7 SCORED	CO7 ALLOTTED	CO7 TARGET	CO8 R	CO8 U	CO8 AP	CO8 AN	CO8 E	CO8 C	CO8 SCORED	CO8 ALLOTTED	CO8 TARGET	CO9 R	CO9 U	CO9 AP	CO9 AN	CO9 E	CO9 C	CO9 SCORED	CO9 ALLOTTED	CO9 TARGET	TOTAL
1	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	43
2	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	0
3	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	70
4	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	43
5	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	29
6	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	37
7	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	50
8	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	29
9	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	35
10	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	34
11	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	37
12	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	37
13	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	37
14	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	38
15	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	0
16	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	0
17	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	0
18	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	27
19	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	36
20	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	a	a	a	a	a	a	0	a	####	37
No of Students Attended	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	

ATTAINMENT LEVEL:	55								
CO	1	2	3	4	5	6	7	8	9
Attainment %	0	0	70	20	0	0	0	0	0

L1 60% STUDENTS SCORING MORE THAN SET TARGET (CLASS AVERAGE / PERCENT)

L2 70% STUDENTS SCORING MORE THAN SET TARGET (CLASS AVERAGE / PERCENTAGE)

L3 80% STUDENTS SCORING MORE THAN SET TARGET (CLASS AVERAGE / PERCENTAGE)

Course Outcomes	Attainment	P_2
CO1	0	0
CO2	0	0
CO3	70	2
CO4	20	0
CO5	0	0
CO6	0	0
CO7	0	0
CO8	0	0
CO9	0	0

Faculty In-charge
Dr. B. Gobalakrishnan

HOD
Dr. D.R. Rajkumar

CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT : Mechanical Engineering

Model Exam Analysis

R2017: COURSE CODE & NAME: ME8391 Engineering Thermodynamics

FACULTY NAME: Dr.B.Gobalakrishnan

QUESTION SECTION			MI - PART A									MI - PART B																										MI - PART C						Assignment/ Quiz/Mid Test Seminar/ Quiz/ Mini Projects	TOTAL MARKS	Total
QUESTION NUMBER			Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11(a)(i)	Q11(a)(ii)	Q11 (a) (iii)	Q11(b)(i)	Q11(b)(ii)	Q11(b)(iii)	Q12(a)(i)	Q12(a)(ii)	Q12 (a) (iii)	Q12(b)(i)	Q12(b)(ii)	Q12(b)(iii)	Q13(a)(i)	Q13(a)(ii)	Q13 (a) (iii)	Q13(b)(i)	Q13(b)(ii)	Q13(b)(iii)	Q14(a)(i)	Q14(a)(ii)	Q14 (a) (iii)	Q14(b)(i)	Q14(b)(ii)	Q14(b)(iii)	Q15(a)(i)	Q15(a)(ii)	Q15 (a) (iii)	Q15(b)(i)	Q15(b)(ii)	Q15(b)(iii)	Q16(a)(i)	Q16(a)(ii)	Q16 (a) (iii)	Q16(b)(i)	Q16(b)(ii)	Q16(b)(iii)			
ALLOTTED MARKS			2	2	2	2	2	2	2	2	2	2	13			13			13			13			13			13			13			13			13			13			13			100	100
COURSE OUTCOME			1	1	2	2	3	3	4	4	5	5	1			1			2			2			3			3			4			4			5			5			1			5				
BT LEVELS [R,U,AP,AN,E,C]			R	U	U	AP	AP	AP	U	R	U	AP	AP			AN			C			E			E			B			C			E			C			E			AP			E				
S.No	Reg Number	STUDENT NAME																																																
1	810720114002	Joe Berlin B	2	2	2	2	2	2	2	2	2	2													13						13												15						61	46
2	810720114003	Karthikeyan R	1	1																																													2	2
3	810720114004	Madeshwaran P	2	2	2	2	2	0	2	2	0	2	13												13																		13						57	43
4	810720114007	Naresh Prabhu P	0	0	0	0	0	0	0	0	0	0																			2						5						13						20	15
5	810720114008	Pristan Rajkumar A																																															0	0
6	810720114009	Rooban K	0	2	2	0	2	0	0	0	2	2																																						10	20	15
7	810720114301	Alfahath N	2	2	0	2	0	0	0	0	0	2													13						15												15						49	37
8	810720114302	Hariharan S	2	1	2	0	0	1	2	1	0	2										13			13																		15						52	39
9	810720114303	Hariram T	0	2	2	0	0	0	2	0	2	0																																						3	11	8
10	810720114304	Jayaprakash P																																															0	0
11	810720114305	Karthikraj N																																															0	0
12	810720114307	Madhavan A																																															0	0
13	810720114309	Prabakaran S																																															0	0
14	810720114310	Pudin Antony A H																																															0	0
15	810720114311	Ragul Raja S	0	2	0	0	2	2	0	0	0	0	3																																				10	19	14
16	810720114312	Ragunath P	0	0	0	0	0	0	0	0	0	0																																						15	15	11
17	810720114313	Rayon Mathews R																																															0	0
18	810720114314	Rishikumar S																																															0	0
19	810720114316	Thanush M																																															0	0
20	810720114317	Udhayanithi K																																															0	0
			CO						CO				CO						CO						CO						CO						CO						CO						CO					
		CO NUMBER	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4	4	4	4	5	5	5	5	5	5	6	6	6	6	6	6	7	7	7	7	7	7	8	8	8	8	8	8	9	9	9	9	9	9
		BT LEVELS	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C	R	U	AP	AN	E	C

Faculty In-charge
Dr. B. Gobalakrishnan

HOD
Dr. D.R. Rajkumar

CARE COLLEGE OF ENGINEE

DEPARTMENT : Mechanic

MODEL EXAM AN

R2017: COURSE CODE & NAME: ME8391

FACULTY NAME: Dr.B.G

QUESTION SECTION			CO1									CO2									CO3									CO4									
BT LEVELS [R,U,AP,AN,E,C]			R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	R
S.No.	Reg Number	STUDENT NAME																																					
1	810720114002	Joe Berlin B	2	2	0	0	0	0	4	4	100	0	2	2	0	0	0	4	4	100	0	0	4	0	13	0	17	17	100	2	2	0	0	0	13	17	17	100	0
2	810720114003	Karthikeyan R	1	1	0	0	0	0	2	4	50	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
3	810720114004	Madeshwaran P	2	2	13	0	0	0	17	17	100	0	2	2	0	0	0	4	4	100	0	0	2	0	13	0	15	17	88	2	2	0	0	0	0	4	4	100	0
4	810720114007	Naresh Prabhu P	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	2	2	17	12	0
5	810720114008	Pristan Rajkumar J	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
6	810720114009	Rooban K	0	2	0	0	0	0	2	4	50	0	2	0	0	0	0	2	4	50	0	0	2	0	0	0	2	4	50	0	0	0	0	0	0	0	4	0	0
7	810720114301	Alfahath N	2	2	0	0	0	0	4	4	100	0	0	2	0	0	0	2	4	50	0	0	0	0	13	0	13	17	76	0	0	0	0	0	13	13	17	76	0
8	810720114302	Hariharan S	2	1	0	0	0	0	3	4	75	0	2	0	0	13	0	15	17	88	0	0	1	0	13	0	14	17	82	1	2	0	0	0	0	3	4	75	0
9	810720114303	Hariram T	0	2	0	0	0	0	2	4	50	0	2	0	0	0	0	2	4	50	0	0	0	0	0	0	0	4	0	0	2	0	0	0	0	2	4	50	0
10	810720114304	Jayaprakash P	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
11	810720114305	Karthikraj N	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
12	810720114307	Madhavan A	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
13	810720114309	Prabakaran S	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
14	810720114310	Pudin Antony A H	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
15	810720114311	Ragul Raja S	0	2	3	0	0	0	5	17	29	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	4	4	100	0	0	0	0	0	0	0	4	0	0
16	810720114312	Ragunath P	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0	0
17	810720114313	Rayon Mathews R	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
18	810720114314	Rishikumar S	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
19	810720114316	Thanush M	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
20	810720114317	Udhayanithi K	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
No of Students Attended			20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20

ATTAINMENT LEVEL :	55								
CO	1	2	3	4	5	6	7	8	9
Attainment %	20	15	25	20	40	0	0	0	0

L1	60% STUDENTS SCORING MORE THAN SET TARGET (CLASS AVERAGE / PERCENT/
L2	70% STUDENTS SCORING MORE THAN SET TARGET (CLASS AVERAGE / PERCENTAGE)
L3	80% STUDENTS SCORING MORE THAN SET TARGET (CLASS AVERAGE / PERCENTAGE)

Course Outcomes	Attainment	XY Ja
CO1	20	0
CO2	15	0
CO3	25	0
CO4	20	0
CO5	40	0
CO6	0	0
CO7	0	0
CO8	0	0
CO9	0	0

Faculty In-charge
Dr. B. Gobalakrishnan

HOD
Dr. D.R. Rajkumar

ERING, TRICHY

al Engineering

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Engineering Thermodynamics

obalakrishnan

CO5								CO6									CO7									CO8									CO9									
U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	TOTAL
2	2	0	15	0	19	17	112	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	27
0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0.9
0	2	0	15	0	17	17	100	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	25
0	0	0	18	0	18	30	60	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	8.9
0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
2	2	0	10	0	14	17	82	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	8.9
0	2	0	15	0	17	17	100	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	22
0	2	0	15	0	17	17	100	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	23
2	0	0	3	0	5	17	29	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	4.9
0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
0	0	0	10	0	10	17	59	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	8.4
0	0	0	15	0	15	17	88	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	6.7
0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0	0	0	0	0	0	0	0	###	0
20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	

Faculty In-charge
Dr. B. Gobalakrishnan

HOD
Dr. D.R. Rajkumar

CARE COLLEGE OF ENGINEERING, TRICHY			
DEPARTMENT : Mechanical Engineering			
END SEMESTER RESULT ANALYSIS			
R2017: COURSE CODE & NAME: ME8391 Engineering Thermodynamics			
FACULTY NAME: Dr.B.Gobulakrishana			
ATTAINMENT LEVEL			60
ALLOTED MARKS			100
S.No	**Reg Number**	**STUDENT NAME**	**GRADE**
1	810720114002	Joe Berlin B	A
2	810720114003	Karthikeyan R	A
3	810720114004	Madeshwaran P	A
4	810720114007	Naresh Prabhu P	A
5	810720114008	Pristan Rajkumar A	A
6	810720114009	Rooban K	A
7	810720114301	Alfahath N	A
8	810720114302	Hariharan S	A
9	810720114303	Hariram T	A
10	810720114304	Jayaprakash P	A
11	810720114305	Karthikraj N	U
12	810720114307	Madhavan A	U
13	810720114309	Prabakaran S	U
14	810720114310	Pudin Antony A H	A
15	810720114311	Ragul Raja S	A
16	810720114312	Ragunath P	U
17	810720114313	Rayon Mathews R	A
18	810720114314	Rishikumar S	B
19	810720114316	Thanush M	B
20	810720114317	Udhayanithi K	B

O	100	0
A+	90	0
A	80	13
B+	70	0
B	60	3
U	LESSTHAN 50	4
UA	UA	0
No of Students Attended		20
ATTAINMENT %		80
Course Outcomes		**ATTAINMENT LEVEL**
CO1		3
CO2		3
CO3		3
CO4		3
CO5		3

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Course Outcome Attainment (R2017)

COURSE OUTCOME	Direct					Indirect	CO Attainment =((Internal*0.20+Univ*0.80)*0.70+Indirect*0.30)
	IA1	IA2	MODEL	Internal	Univ		
CO 1	1	0.1	0.1	0	3	1	**1.98**
CO 2	1	0.1	0.1	0	3	3	**2.58**
CO 3	0.1	2	0.1	1	3	2	**2.42**
CO 4	0.1	0.1	0.1	0	3	3	**2.58**
CO 5	0.1	0.1	0.1	0	3	2	**2.28**
CO 6							
CO 7							
CO 8							
CO 9							

Mapping course outcome with programme outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3											
CO2	3	3	3											
CO3	3	2	3											
CO4	2	3	2											
CO5	3	2	2											
CO6														
CO7														
CO8														
CO9														

PO ATTAINMENT:

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1.98	1.32	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO2	2.58	0.86	2.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO3	2.42	1.61	2.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO4	1.72	2.58	1.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO5	2.28	1.52	1.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO6														

CO7														
CO8														
CO9														
AVERAGE PO	2.20	1.58	2.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Faculty In-charge
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HOD
Dr. D.R. Rajkumar

CARE COLLEGE OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

ODD SEMESTER 2021-2022 TIME TABLE – MODEL EXAMINATION II (13.12.2021 TO 18.12.2021)

DATE	SESSION	IV YEAR		III YEAR		II YEAR	
13.12.2021 (MON)	FN 09:30 A.M TO 12.30 P.M	ME8099	ROBOTICS	ME8595	THERMAL ENGINEERING- II	CE8394	FLUID MECHANICS AND MACHINERY
14.12.2021 (TUE)	FN 09:30 A.M TO 12.30 P.M	OML751	TESTING OF MATERIALS	ME8501	METROLOGY AND MEASUREMENTS	ME8351	MANUFACTURING TECHNOLOGY - I
15.12.2021 (WED)	FN 09:30 A.M TO 12.30 P.M	ME8791	MECHATRONICS	ME8594	DYNAMICS OF MACHINES	MA8353	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS
16.12.2021 (THU)	FN 09:30 A.M TO 12.30 P.M	GE8077	TOTAL QUALITY MANAGEMENT	ORO551	RENEWABLE ENERGY SOURCES	EE8353	ELECTRICAL DRIVES AND CONTROLS
17.12.2021 (FRI)	FN 09:30 A.M TO 12.30 P.M	ME8792	POWER PLANT ENGINEERING	ME8593	DESIGN OF MACHINE ELEMENTS	ME8391	ENGINEERING THERMODYNAMICS
18.12.2021 (SAT)	FN 09:30 A.M TO 12.30 P.M	ME8793	PROCESS PLANNING AND COST ESTIMATION	****	*********	****	*********

EXAM CELL

PRINCIPAL

Roll Number												

CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT OF MECHANICAL ENGINEERING

CLASS:	:	**II B.E MECHANICAL**	**MAX MARKS**	:	**100**
SEMESTER:	:	**III**	**DURATION**	:	**3:00 Hrs**
SUBJECT:	:	**Engineering Thermodynamics**	**CODE**	:	**ME8391**
COURSE NO	:	**C391**	**DATE**	:	**17.12.2021, FN**
ACADEMIC YEAR	:	**2021 – 22 (ODD)**	**EXAM**	:	**MODEL II**

PART – A (10 X 2 = 20 Marks)				
I	**ANSWER ALL QUESTIONS**		**BT level**	**Course Outcome**
	1.	Express flow Energy.	K1	C391.1
	2.	Define Zeroth Law of thermodynamics. Why it is so called?	K1	C391.1
	3.	What is microscopic approach in thermodynamics?	K1	C391.1
	4.	Why does free expansion have zero work transfer	K1	C391.1
	5.	Define Avogadro's law.	K1	C391.4
	6.	What is known as equation of state and when it can be used for engineering calculations?	K1	C391.4
	7.	What is real gas? Give examples.	K1	C391.4
	8.	Summarize why humidification of air is necessary.	K1	C391.5
	9.	What is the law of corresponding states?	K1	C391.5
	10.	How the wet bulb temperature does differ from the dry bulb temperature?	K1	C391.5

PART – B (5 X 13 = 65 Marks)							
II	**ANSWER ALL QUESTIONS**					**BT Level**	**Course Outcome**
	11	(a)	(i)	The values of specific heats at constant pressure and at constant volume for an ideal gas are 0.984 kJ/kg K and 0.728 kJ/kg K. Find the values of characteristic gas constant (R) and ratio of specific heats(γ) for the gas. If one kg of this gas is heated at constant pressure from 25°C to 200°C, estimate the heat added, ideal work done and change in internal energy. Also calculate the pressure and final volume, if the initial volume was 2 m^3.	13	K3	C391.1
				(OR)			
		(b)	(i)	A vessel of capacity 3 m^3 contains air at a pressure of 1.5 bar and a temperature of 25°C. Additional air is now	13	K3	C391.1

				pumped into the system until the pressure rises to 30 bar and temperature rises to 60°C. Determine the mass of air pumped in and express the quantity as a volume at a pressure of 1.02 bar and a temperature of 20°C. if the vessel is allowed to cool until the temperature is again 25°C, calculate the pressure in the vessel.			
	12	(a)	(i)	Derive the steady flow energy equation and reduce it for a turbine, pump, nozzle and a heat exchanger.	13	K3	C391.1
				(OR)			
		(b)	(i)	Derive the Clausius Clapeyron equation and discuss its significance. Write down two Tds relation.	7 6	K3	C391.4
	13	(a)	(i)	5 kmol of carbon monoxide (CO) is stored in a 1.135 m^3 container at 215 K. Determine the pressure using (i) ideal gas equation (ii) van der waals equation. The constants in the van der waals equation are 146.3 KPa $m^6/kmol^2$, and 0.0394 $m^3/kmol$.	13	K3	C391.4
				(OR)			
		(b)	(i) (ii)	A vessel of volume 0.28 m3 contains 10 kg of air at 320 K. Determine pressure exerted by the air using (i) perfect gas equation (ii) van der waals equation (iii) generalized compressibility chart. (Take critical pressure as 37.7 bar and critical temperature as 132.8 K for air.	13	K3	C391.4
	14	(a)	(i)	A vessel of capacity 3 m^3 contains 1 kgmol of N_2 at 90 °C. (i) Calculate pressure and specific volume of gas (ii) If the ratio of specific heat is 1.4 evaluate C_p and C_v. (iii) Subsequently the gas cools to the atmospheric temperature of 20 °C, the evaluate the final pressure of gas. (iv) Evaluate increase in specific internal energy, increase in specific enthalpy, increase in specific entropy and magnitude and direction of heat transfer.	13	K3	C391.4
				(OR)			
		(b)	(i)	A hall is to be air conditioned for the following data: Outdoor condition 35°C DBT, 18°C WBT, required comfort conditions 20°C DBT and 60 RH, seating capacity of the hall 2000, amount of outside air supplied 0.35 m^3/min/person. if the required condition is achieved first by adiabatic humidification and then by cooling, determine (i) capacity of cooling coil (ii) capacity of humidifier.	13	K3	C391.5
	15	(a)	(i)	Atmospheric air at 1.0132 bar has 20 °C DBT and 65% RH. Find humidity ratio, wet bulb temperature, dew point temperature, degree of saturation, enthalpy of mixture, density of air and density of vapour in the mixture.	13	K3	C391.5
				(OR)			

		(b)	(i)	The exhaust gas of an internal combustion engine is found to have 9.8% CO_2, 0.3% CO, 10.6% H_2O, 4.5% O_2, and 74.8% N_2 by volume. Calculate molar mass and gas constant of the exhaust gas. If the volume flow rate of the exhaust gas is 2 m^3/h at 100 kPa and 573K, calculate the mass flow rate.	13	K3	C391.5
				PART – C (1 X 15 = 15 Marks)			
III				**ANSWER ALL QUESTIONS**		**BT Level**	**Course Outcome**
	16	(a)		A system contains 0.15 m^3 of a gas at a pressure of 3.8 bar and 150 °C. It is expanded adiabatically till the pressure falls to 1 bar. The gas is then heated at a constant pressure till its enthalpy increases by 70 KJ. Determine the total work done. Take C_p = 1 KJ/Kg K and C_v = 0.714 KJ/Kg K.	15	K3	C391.1
				(OR)			
		(b)		An office is to be air conditioned for 50 staff when the outdoor conditions are 30 °C and 75% RH, if the quantity of air supplied is 0.4 m^3/min/person, find the following a) Capacity of the cooling coil in tons of refrigeration b) Capacity of the heating coil in KW c) Amount of water vapour removed per hour. Assume that required air inlet conditions are 20 °C DBT and 60% RH. Air is conditioned first by cooling and dehumidifying and then by heating. If the heating coil surface temperature is 25 °C find the by-pass factor of the heating coil.	15	K3	C391.5

Blooms Levels: K1 - Remember, K2 – Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

Dr. B. Gobalakrishnan	Dr. D.R. Rajkumar	Dr. S. Shanthi
Faculty In-charge	**HOD**	**Principal**

CARE COLLEGE OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

ODD SEMESTER 2021-2022 TIME TABLE – MODEL EXAMINATION III (23.12.2021 TO 03.01.2022)

DATE	SESSION	IV YEAR		III YEAR		II YEAR	
23.12.2021 (THU)	AN 01:30 P.M TO 04.30 P.M	ME8099	ROBOTICS	ME8595	THERMAL ENGINEERING- II	CE8394	FLUID MECHANICS AND MACHINERY
24.12.2021 (FRI)	AN 01:30 P.M TO 04.30 P.M	OML751	TESTING OF MATERIALS	ME8501	METROLOGY AND MEASUREMENTS	ME8351	MANUFACTURING TECHNOLOGY - I
27.12.2021 (MON)	AN 01:30 P.M TO 04.30 P.M	ME8791	MECHATRONICS	ME8594	DYNAMICS OF MACHINES	MA8353	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS
28.12.2021 (TUE)	AN 01:30 P.M TO 04.30 P.M	GE8077	TOTAL QUALITY MANAGEMENT	ORO551	RENEWABLE ENERGY SOURCES	EE8353	ELECTRICAL DRIVES AND CONTROLS
29.12.2021 (WED)	AN 01:30 P.M TO 04.30 P.M	ME8792	POWER PLANT ENGINEERING	ME8593	DESIGN OF MACHINE ELEMENTS	ME8391	ENGINEERING THERMODYNAMICS
03.01.2022 (MON)	AN 01:30 P.M TO 04.30 P.M	ME8793	PROCESS PLANNING AND COST ESTIMATION	****	**********	****	**********

EXAM CELL

PRINCIPAL

Reg. Number												

CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT OF MECHANICAL ENGINEERING

CLASS:	:	**II B.E MECHANICAL**	**MAX MARKS**	:	**100**
SEMESTER:	:	**III**	**DURATION**	:	**3:00 Hrs**
SUBJECT:	:	**Engineering Thermodynamics**	**CODE**	:	**ME8391**
COURSE NO	:	**C391**	**DATE**	:	**29.12.2021, AN**
ACADEMIC YEAR	:	**2021 – 22 (ODD)**	**EXAM**	:	**MODEL - III**

PART – A (10 X 2 = 20 Marks)

I		ANSWER ALL QUESTIONS	BT level	Course Outcome
	1.	What is microscopic approach in thermodynamics?	K1	C391.1
	2.	Define Zeroth Law of thermodynamics. Why it is so called?	K1	C391.1
	3.	Draw a schematic of a heat pump.	K1	C391.2
	4.	Define Exergy.	K1	C391.2
	5.	What is meant by dead state?	K1	C391.3
	6.	Define triple point and identify the triple point of water.	K1	C391.3
	7.	Define Avogadro's law.	K1	C391.4
	8.	What is Joule-Thomson coefficient? Why is it zero for an ideal gas?	K1	C391.4
	9.	What is the law of corresponding states?	K1	C391.5
	10.	Summarize why humidification of air is necessary.	K1	C391.5

PART – B (5 X 13 = 65 Marks)

II				ANSWER ALL QUESTIONS		BT Level	Course Outcome
	11	(a)	(i)	Derive the steady flow energy equation and reduce it for a turbine, pump, nozzle and a heat exchanger.	13	K2	C391.1
				(OR)			
		(b)	(i)	A vessel of capacity 3 m^3 contains air at a pressure of 1.5 bar and a temperature of 25°C. Additional air is now pumped into the system until the pressure rises to 30 bar and temperature rises to 60°C. Determine the mass of air pumped in and express the quantity as a volume at a pressure of 1.02 bar and a temperature of 20°C. if the vessel is allowed to cool until the temperature is again 25°C, calculate the pressure in the vessel.	13	K3	C391.1
	12	(a)	(i)	Two reversible heat engines A and B are arranged in	13	K3	C391.2

				series. Engine A rejecting heat directly to engine B, receives 200 kJ at a temperature of 421°C from a hot source, while engine B is in communication with a cold sink at a temperature of 4.4°C. If the work output of A is twice that of B, find The intermediate temperature between A and B The efficiency of each engine and The heat rejected to the cold sink.			
				(OR)			
		(b)	(i)	Air expands through a turbine from 500 KPa, 520 °C to 100 KPa, 300 °C. During expansion 10 KJ/kg of heat is lost to the surroundings which is at 98 KPa, 20 °C. Neglecting the KE and PE changes, determine power kg of air, (i) the decrease in availability (ii) the maximum work and (iii) the irreversibility. For air Cp = 1.005 KJ/kg K.	13	K3	C391.2
	13	(a)	(i)	Explain the steam formation with relevant sketch and label all salient points and explain every point in detail.	13	K3	C391.3
				(OR)			
		(b)	(i)	A steam power plant used steam as working fluid and operates at a boiler pressure of 5 MPa, dry saturated and a condenser pressure of 5 KPa. Determine the cycle efficiency for (i) Carnot cycle (ii) Rankine cycle. Also, show TS representation of both the cycles.	13	K3	C391.3
	14	(a)	(i)	A vessel of capacity 3 m3 contains 1 kgmol of N_2 at 90 °C. (i) Calculate pressure and specific volume of gas (ii) If the ratio of specific heat is 1.4 evaluate C_p and C_v. (iii) Subsequently the gas cools to the atmospheric temperature of 20 °C, the evaluate the final pressure of gas. (iv) Evaluate increase in specific internal energy, increase in specific enthalpy, increase in specific entropy and magnitude and direction of heat transfer.	13	K3	C391.4
				(OR)			
		(b)	(i)	A vessel of volume 0.28 m3 contains 10 kg of air at 320 K. Determine pressure exerted by the air using (i) perfect gas equation (ii) van der waals equation (iii) generalized compressibility chart. (Take critical pressure as 37.7 bar and critical temperature as 132.8 K for air.	13	K3	C391.4
	15	(a)	(i)	The exhaust gas of an internal combustion engine is found to have 9.8% CO_2, 0.3% CO, 10.6% H_2O, 4.5% O_2, and 74.8% N_2 by volume. Calculate molar mass and gas constant of the exhaust gas. If the volume flow rate of the exhaust gas is 2 m^3/h at 100 kPa and 573K, calculate the mass flow rate.	13	K3	C391.5

				(OR)			
		(b)	(i)	A hall is to be air conditioned for the following data: Outdoor condition 35°C DBT, 18°C WBT, required comfort conditions 20°C DBT and 60 RH, seating capacity of the hall 2000, amount of outside air supplied 0.35 m^3/min/person. if the required condition is achieved first by adiabatic humidification and then by cooling, determine (i) capacity of cooling coil (ii) capacity of humidifier.	13	K3	C391.5
				PART – C (1 X 15 = 15 Marks)			
III				**ANSWER ALL QUESTIONS**		**BT Level**	**Course Outcome**
	16	(a)		A system contains 0.15 m^3 of a gas at a pressure of 3.8 bar and 150 °C. It is expanded adiabatically till the pressure falls to 1 bar. The gas is then heated at a constant pressure till its enthalpy increases by 70 KJ. Determine the total work done. Take C_p = 1 KJ/Kg K and C_v = 0.714 KJ/Kg K.	15	K3	C391.1
				(OR)			
		(b)		An office is to be air conditioned for 50 staff when the outdoor conditions are 30 °C and 75% RH, if the quantity of air supplied is 0.4 m^3/min/person, find the following a) Capacity of the cooling coil in tons of refrigeration b) Capacity of the heating coil in KW c) Amount of water vapour removed per hour. Assume that required air inlet conditions are 20 °C DBT and 60% RH. Air is conditioned first by cooling and dehumidifying and then by heating. If the heating coil surface temperature is 25 °C find the by-pass factor of the heating coil.	15	K3	C391.5

Blooms Levels: K1 - Remember, K2 – Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

Dr. B. Gobalakrishnan	Dr. D.R. Rajkumar	Dr. S.Shanthi
Faculty In-charge	**HOD**	**Principal**

CARE
COLLEGE OF ENGINEERING

(Approved by AICTE and Affiliated to Anna University, Chennai)

27, Thayanur, Trichy - 620009

Dept of Mechanical Engineering

Special Coaching/ Remedial Class Schedule

II ME (2021-2022 ODD)

Subject Name: ME8391 - Engineering Thermodynamics

Faculty In-charge: Dr. B. Gobalakrishnan

Batch: **Timing: 4.00 pm-5.00 pm**

S. No.	Reg. No.	Student Name	20/12/2021	21/12/2021	22/12/2022
1	610720114313	Rayon Mathews R	Types of thermodynamics process related problems	Second law of Thermodynamics and related problems	Gas mixtures and Psychrometric related problems
2	610720114003	Karthikeyan R			
3	610720114006	Pristan Rajkumar A			
4	610720114009	Rooban K			
5	610720114303	Hariram T			
6	610720114311	Ragul Raja S			
7	610720114312	Ragunath P			
8	610720114310	Pudin Antony A H			
9	610720114317	Udhayanithi K			

Activities Planned During this Schedule:

1 Preparation Students with Previous Year University Questions - and How to write the Answer - explanation Given

2 Model Exam conducted After this Coaching Class on 29.12.2021 and result analysis was attached below

Faculty In-charge
Dr. B. Gobalakrishnan

HOD
Dr. D.R. Rajkumar

Department of Mechanical Engineering

End Semester Question Paper Mapping

Year & Branch	**II B.E. MECH**	**Max Marks**	**100**
Semester	**III**	**Duration**	**3:00 Hrs**
Subject	**Engineering Thermodynamics**	**Code**	**ME8391**
AU Exam Month/Year	**April/May 2019**	**Date of Exam**	

PART – A (10 X 2 = 20 Marks)					
I. Answer All Questions (Each Carries 2 marks)		**Text/Reference/ any other Book**	**Book Page No.**	**Exercise No.**	**Question No.**
1.	Differentiate between Intensive and Extensive properties.	R2	9		
2.	State the zeroth law of thermodynamics.	T1	23		
3.	Define entropy of a pure substance.	T1	63		
4.	What is irreversibility of a process?	T1	45		
5.	Write a short note on Mollier chart.	R2	223		
6.	List the advantages in superheating of steam.	R2	201		
7.	State the assumptions made in driving ideal gas equation using the kinetic theory of gases.	T1	376		
8.	What is Clausius-Claperyon equation?	R2	22		
9.	Identify the relationship between the partial pressures of the constituents in gas mixtures.	R2			
10.	How will you define Psychrometrics?	R2	812		

PART – B (5 X 13 = 65 Marks)							
ANSWER ALL QUESTIONS				**Text/Re/ any other Book**	**Book Page No.**	**Exercise No.**	**Question No.**
11.	a	i	The gas expanding in the combustion space of a reciprocating engine has an initial pressure of 50 bar and an initial temperature of 1623 °C. The initial volume is 50000 mm^3 and the gas expands through a volume ratio of 20 according to the law $pV^{1.25}$ = constant. Calculate:	R2	75	3.14	

			a) The work transfer and b) Heat transfer in the expansion process. Take R = 270 J/kgK and C_v = 800 J/kg K.				
OR	b	i	The power output of an adiabatic steam turbine is 5 MW, and the state of steam entering the turbine is pressure 2 MPa; Temperature 400°C; velocity 50 m/s; elevation 10 m. The state of the steam leaving the turbine is: pressure 15 kPa; dryness fraction 0.9; velocity 180 m/s; elevation 6 m. Determine, a) the change in enthalpy, kinetic energy and potential energy. b) the work done per unit mass of the steam flowing through the turbine. the mass flow rate of the steam.	R2	94		
12.	a	i	A Carnot heat engine draws heat from a reservoir at temperature 600 K and rejects heat to another reservoir at temperature Ts. The Carnot forward cycle engine drives a Carnot reversed cycle engine or Carnot refrigerator which absorbs heat from reservoir at temperature 300 K and rejects heat to a reservoir at temperature Ts, determine: a) The temperature T3 such that heat supplied to engine Q is equal to the heat absorbed by refrigerator Q. b) The efficiency of Carnot engine and C.O.P. of Carnot refrigerator.	R2	25	1.7	
OR	b	i	Air expands through a turbine from 500 kPa, 520°C to 100 kPa, 300°C. During expansion 10 kJ/kg of heat is lost to the surroundings which is at 98 kPa, 20°C. Neglecting the kinetic and potential energy changes, determine per kg of air, The decrease in availability, The maximum work, and The irreversibility. For air C =1.005 kJ/kgK and h=C_pT	T1	323	6.11	
13.	a	i	The steam conditions at inlet to the turbine are 42 bar and 500°C, and the condenser pressure is 0.035 bar. Assume that the steam is just dry saturated on leaving the first turbine, and is	R2	287		10

			reheated to its initial temperature. Calculate the Rankine cycle efficiency and specific steam consumption with reheating by neglecting the pump work using Mollier chart.				
OR	b	i	A pressure cooker contains 1.5 kg of saturated steam at 5 bar. Find the quantity of heat which must be rejected so as to reduce the quality to 60% dry. Determine the pressure and temperature of the steam at the new state.	T1	576		
14.	a	i	A vessel of capacity $3m^3$ contains 1 kg mole of N, at 90°C. a) Calculate pressure and the specific volume of the gas. If the ratio of specific heats is 1.4, evaluate the values of C_p, and C_v, b) Subsequently, the gas cools to the atmospheric temperature of 20°C, then evaluate the final pressure of gas. Evaluate the increase in specific internal energy, the increase in specific enthalpy, increase in specific entropy and magnitude and sign of heat transfer.	T1	661		
OR	b	i	CO_2 flows at a pressure of 10 bar and 180°C into a turbine, located in a CO chemical plant, and there it expands reversibly and adiabatically to a final pressure of 1.05 bar. Calculate the final specific volume, temperature and increase in entropy. Neglect changes in velocity and elevation. If the mass flow rate is 6.5 kg/min, evaluate the heat transfer rate from the gas and the power delivered by the turbine. Assume CO_2, to be a perfect gas and C_v,= 0.837 kJ/kg K.	T1	544		
15.	a	i	Atmospheric air at 38°C and 25% relative humidity passes through an evaporator cooler. If the final temperature of air is 18°C, how much water is added per kg of dry air and what is the final relative humidity?	R2	802	37.1	
OR	b	i	A perfect gas mixture consists of 4 kg of N_2, and 6 kg of CO_2, at a pressure of 4 bar and a temperature of 25°C. Calculate C_v, and C_p, of the mixture. If the mixture is heated at constant volume to	T1	443	9.22	

			50°C. Find the and entropy of the in internal energy, enthalpy change mixture. for N_2: C_v, =0.745 kJ/kg K, C_p, = 1.041 kJ/kg K Take: For CO_2: Cv, = 0.653 kJ/kg K, C_p, =0.842 kJ/kg K.				

ANSWER ALL QUESTIONS				Text/Re/ any other Book	Book Page No.	Exercise No.	Question No.
16	a	i	Two vessels, A and B, both containing nitrogen, are connected by a value which is opened to allow the contents to mix and achieve an equilibrium temperature of 27°C. Before mixing in vessel A has pressure 1.5 MPa temperature 50°C, contents 0.5 kg mole and vessel B has a pressure 0.6 MPa, temperature 20°C, contents 2.5 kg mole. Compute the final equilibrium pressure, and the amount of heat transferred to in surroundings. If the vessel is perfectly insulated, calculate the temperature which would have been and pressure reached. Take γ=1.4.	T1	432	9.12	
OR	b	i	An air-water vapour mixture enters an air-conditioning unit at a pressure of 1.0 bar. 38°C DBT, and a relative humidity of 75%. The mass of dry air entering is 1 kg/s. The air-vapour mixture leaves the air-conditioning unit at 1.0 bar, 18°C, 85% relative humidity. The moisture condensed leaves at 18°C. Sketch the process in the psychrometric chart and determine the heat transfer rate for the process.	T1			

TEXT/REFERENCE BOOKS:

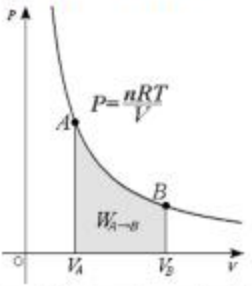
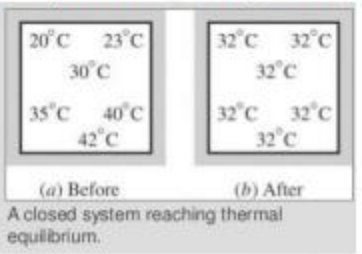
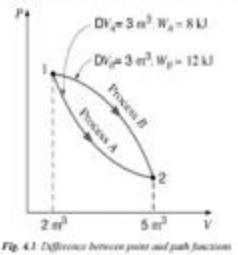
T/R	BOOK TITLE/AUTHORS/PUBLICATION
T1	R.K.Rajput, "A Text Book Of Engineering Thermodynamics ",Fifth Edition,2017.
R1	Nag.P.K., "Engineering Thermodynamics", 5 Edition, Tata McGraw-Hill, New Delhi, 2013.
R2	R.S. Khurmi & J.K. Gupta "A textbook of Thermal Engineering, S. Chand & Company Limited, Ram nagar, New Delhi, 2011

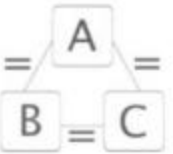
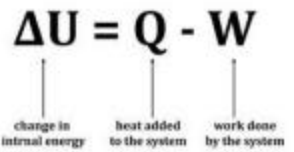
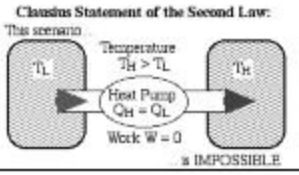
Dr. B. Gobalakrishnan
Faculty In-charge

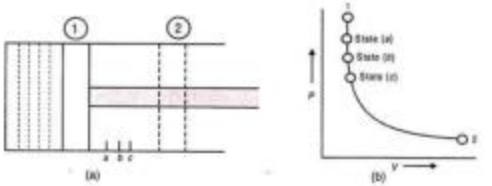
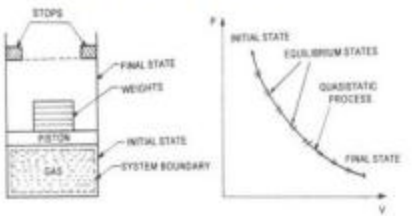
Dr. D.R. Rajkumar
HOD

Dr. S. Shanthi
Principal

CARE COLLEGE OF ENGINEERING, TRICHY
DEPARTMENT OF MECHANICAL ENGINEERING
II B.E MECHANICAL ENGINEERING
ME 8391 - ENGINEERING THERMODYNAMICS
Unit Test - I
ANSWER KEY

I		Key works Part A	Marks
	1.	Isothermal process with PV diagram 	2 marks
	2.	Thermodynamic equilibrium- Thermal equilibrium, Mechanical equilibrium.  A closed system reaching thermal equilibrium.	2 marks
	3.	Point function and path function process with diagram  Fig. 4.1 Difference between point and path functions	2 marks
	4.	Zeroth Law of thermodynamics with diagram	2 marks

			
	5.	First law with process question – Energy can neither created nor destroyed 	2 marks
	6.	Second law with process diagram - The total entropy of an isolated system can never decrease. 	2 marks

II	Part B			Marks
	07.	(a)	(i) Point and path function with neat diagram (ii) Property state process and path with diagram Intensive Properties, Extensive Properties:  Fig. 1.8 (iii) Quasi-static process with diagram 	3 marks 3 marks 7 marks

		(b)	$m_1 = \frac{P_1 v_1}{R T_1} = \frac{0.15 \times 10^6 \times 3}{287 \times 298} = 5.26\ \text{kg}$ $m_2 = \frac{P_2 v_2}{R T_2} = \frac{3 \times 10^6 \times 3}{287 \times 333} = 94.17\ \text{kg}$ $m = m_2 - m_1 = 94.17 - 5.26 = 88.91\ \text{kg}$ $v_3 = \frac{m R T_3}{p_3} = \frac{88.91 \times 287 \times 293}{0.102 \times 10^6} = 73.3\ \text{m}^3$ $\frac{p_4}{p_2} = \frac{T_4}{T_2}$ $p_4 = \frac{T_4 P_2}{T_2} = \frac{298 \times 3 \times 10^6}{333} = 2.68 \times 10^6\ \text{N/m}^2 = 26.8\ \text{bar}$	2 marks 2 marks 3 marks 3 marks 3 marks

Faculty In-charge **HOD**

CARE

COLLEGE OF ENGINEERING

(Approved by AICTE and Affiliated to Anna University, Chennai)

27, Thuvarai, Trichy - 620009

Department of Mechanical Engineering

Special Coaching/ Remedial Class Schedule

II ME (2020 -2024 OBE)

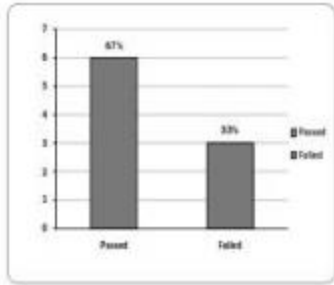
Subject Name: ME8391 - Engineering Thermodynamics

Faculty In-charge: Dr. B. Gobalakrishnan

Batch: II ME — April/May 2023

S. No.	Reg. No.	Student Name	Result
1	810720114313	Rayon Mathews R	F
2	810720114003	Karthikeyan R	F
3	810720114005	Pirsian Rajkumar A	F
4	810720114009	Roobam K	F
5	810720114303	Hariram T	F
6	810720114311	Ragul Raja S	F
7	810720114312	Ragunath P	F
8	810720114310	Pudin Antony A H	F
9	810720114317	Udhayanithi K	F

Total Students Appears	9
Passed	6
Failed	3
Pass Percentage	67%



Remarks to get the improved/ decreased results.

1	Totally 9 students were identified as slow learners. Conducted coaching classes
2	6 Students were passed and 3 students were failed but considering previous performance now some improvements were noted.
3	Again coaching classes will be conduct for failed students and improve their subject knowledge

Faculty In-charge
Dr. B. Gobalakrishnan

HOD
Dr. D.R. Rajkumar

CARE
GROUP OF INSTITUTIONS
TRICHY - 620 009

MODEL EXAMINATION

Reg. No : 8 1 0 7 2 0 1 1 4 3 1 1

College Code & Name	CARE COLLEGE OF ENGINEERING		
Student Name	S. RAGUL RAJA		
Degree/Branch	B.E MECH	Semester	III
Subject Code	ME 8391	Date & Session	29.12.2021
Subject Title	Engineering Thermodynamics	No of Pages used	17

S. Ragul
Chief Superintendent's Signature / Facsimile

All Particulars given are verified
29/12/21
Name of the Hall Superintendent

DO NOT WRITE THE REGISTER NUMBER, ROLL NO, COLLEGE CODE AND THE NAME IN ANY OTHER PART OF THE ANSWER BOOK

Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

Question No.	✓	Marks	Question No.		i ✓	i Marks	ii ✓	ii Marks	iii ✓	iii Marks	Total Marks	Grand Total
1	✓	12	11	a	✓	13						72/-
2	✓	13		b								
3			12	a	✓	13						
4				b								
5			13	a								
6				b	✓	13						
7	✓	13	14	a								
8	✓	12		b								
9			15	a								
10				b	✓	13						
			16	a								
				b	✓	14						
Total		6								Total	66	

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

31/12/2021 Date of Valuation	B. GOBALAKRISHNAN Name of the Examiner	Signature of the Examiner

To be filled in by the Candidate

Statement of student stating all comments/ Corrections noted	Signature of the Candidate

CARE
GROUP OF INSTITUTIONS
TRICHY - 620 009

MODEL EXAMINATION

Reg. No : 8 1 0 7 2 0 1 1 4 3 1 2

College Code & Name	CARE College of Engineering		
Student Name	D. RAGUNATH		
Degree/Branch	B.E - MECHANICAL.	Semester	III
Subject Code	ME 8391	Date & Session	29.12.2021 - AN.
Subject Title	Engineering thermodynamics.	No of Pages used	12.

B. Thaiyp.
Chief Superintendent's Signature / Facsimile

All Particulars given are verified
29/12/21
R. RAMESH
Name of the Hall Superintendent

DO NOT WRITE THE REGISTER NUMBER, ROLL NO, COLLEGE CODE AND THE NAME IN ANY OTHER PART OF THE ANSWER BOOK

Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

Question No.	✓	Marks	Question No.		i ✓	i Marks	ii ✓	ii Marks	iii ✓	iii Marks	Total Marks	Grand Total
1			11	a	✓	13						66.1
2				b								
3			12	a								
4				b	✓	13						
5			13	a								
6				b	✓	13						
7			14	a								
8				b								
9			15	a	✓	13						
10				b	✓							
			16	a								
				b	✓	14						
Total										Total		

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

31/12/2021	B. GOBALAKRISHNAN.	
Date of Valuation	Name of the Examiner	Signature of the Examiner

To be filled in by the Candidate

Statement of student stating all comments/ Corrections noted	Signature of the Candidate

CARE
GROUP OF INSTITUTIONS
TRICHY - 620 009

MODEL EXAMINATION

Reg. No : 8 1 0 7 2 0 1 1 4 3 1 0

College Code & Name	8107 / Care College of Engineering		
Student Name	Pudin Antony. A. H		
Degree/Branch	B.E / Mechanical	Semester	III rd
Subject Code	M.E 8391	Date & Session	29/12/2021
Subject Title	Engineering Thermodynamics	No of Pages used	19 pages

Chief Superintendent's Signature / Facsimile

All Particulars given are verified

R. VANDHA

Name of the Hall Superintendent

DO NOT WRITE THE REGISTER NUMBER, ROLL NO, COLLEGE CODE AND THE NAME IN ANY OTHER PART OF THE ANSWER BOOK

Instruction to the Candidate. Put (✓) for the questions attended in the tick mark column against each question

Question No.	✓	Marks	Question No.		i ✓	i Marks	ii ✓	ii Marks	iii ✓	iii Marks	Total Marks	Grand Total
1	✓	2	11	a	✓	10						
2	✓	2		b								
3	✓	2	12	a								
4	✓	2		b								
5	✓	1	13	a	✓	10						
6	✗			b	✗							
7	✓	2	14	a								
8	✓	2		b								
9	✓	2	15	a								
10	✓	2		b								
			16	a	✓	12						
				b								
Total		17								Total	33	

Declaration by the Examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

Date of Valuation	Name of the Examiner	Signature of the Examiner
31/12/2021	B. GOBAKRISHNAN	

To be filled in by the Candidate

Statement of student stating all comments/ Corrections noted	Signature of the Candidate