


Name:			
Enrolment No:			
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, December 2022			
Course: THERMODYNAMICS OF MATERIALS		Semester: III	
Program: M.SC PHYSICS		Time : 03 hrs.	
Course Code: PHYS 8022		Max. Marks: 100	
Instructions:			
SECTION A (5Qx4M=20Marks)			
S. No.		Marks	CO
Q 1	Confirm the <i>True</i> or <i>False</i> status of the following: (a) Isothermal compression requires minimum work. (b) If the temperature is constant, internal energy does not change. (c) The friction present in moving devices makes a process reversible. (d) In the reversible adiabatic expansion of gas, the increase in disorder due to an increase in volume is compensated by the decrease in disorder due to a decrease in temperature.	4	CO1
Q 2	What is an ideal solution?	4	CO2
Q 3	What is phase transformation?	4	CO3
Q 4	What is the Lever rule?	4	CO4
Q 5	State the Raolt's law.	4	CO2
SECTION B (4Qx10M= 40 Marks)			
Q 6	What is the 2 nd law of thermodynamics? In your own words, explain its significance.	4+6	CO1
Q 7	List and explain the concept of <i>Partial Molar Quantities</i> .	10	CO2
Q 8	Explain lucidly the idea of surfaces and interfaces in thermodynamics.	10	CO3
Q 9	What are phase diagrams? Explain the Binary phase diagrams. OR Give your own understanding in interpreting phase diagrams.	3+7	CO4
SECTION-C (2Qx20M=40 Marks)			
Q 10	What are thermodynamic variables and functions? Briefly elaborate on some of them. a) Apply them and build the Maxwell relations in thermodynamics.	10+10	CO1

	<u>OR</u>		
	b) Develop a picture to statistically interpret <i>Entropy</i> .		
Q 11	Explain the concept of <i>defects</i> . In your own understanding what can be the different types of point defects? Giving reasons, build a description of the nature of these.	20	CO3