

C.U.SHAH UNIVERSITY

Winter Examination-2015

Subject Name : Heat and Thermodynamics

Subject Code : 4SC03PHC1

Branch : B.Sc.(All)

Semester :3 Date : 10/12/2015 Time : 02:30 To 05:30

Marks : 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

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- Q-1 Attempt the following questions: (14)**
- a) Write Zeroth law of thermodynamics. 01
 - b) Write First law of thermodynamics. 01
 - c) What is Heat? 01
 - d) What is Temperature? 01
 - e) What is atmosphere Lapse rate? 01
 - f) Write Third law of thermodynamics. 01
 - g) Write Kelvin's statement of Second law of thermodynamics. 01
 - h) Define radiant heat. 01
 - i) Define absorbing power. 01
 - j) What is reflecting power? 01
 - k) Define transmitting power. 01
 - l) Write expression of Clausius-Clapeyron relation. 01
 - m) What is black body material? 01
 - n) Explain Wien's law. 01
- Attempt any four questions from Q-2 to Q-8**
- Q-2 Attempt all questions (14)**
- a) What is specific heat? Derive the relation $C_p - C_v = R$. 07
 - b) Explain Carnot engine and its efficiency. 07
- Q-3 Attempt all questions (14)**
- a) Discuss 1st and 2nd order phase transition. 07
 - b) Calculate the formula of work done during an adiabatic process. 07
- Q-4 Attempt all questions (14)**
- a) Derive Differential form of First law of thermodynamics. 05
 - b) Explain temperature-entropy diagram. 05
 - c) Write a short note on Carnot cycle. 04



Q-5	Attempt all questions	(14)
	a) Explain the applications of First law of thermodynamics.	05
	b) Derive Maxwell's thermodynamic relation.	05
	c) Discuss Stefan's law.	04
Q-6	Attempt all questions	(14)
	a) What is TDS equations? Derive 1 st and 2 nd TDS equations.	07
	b) Discuss the main properties of radiant heat in detail.	07
Q-7	Attempt all questions	(14)
	a) Explain derivations of Maxwell's relation.	07
	b) Write short notes on (1) Rayleigh-Jeans law and (2) Plank's law.	07
Q-8	Attempt all questions	(14)
	a) Derive 1 st and 2 nd order energy equations.	05
	b) Explain Joule-Kelvin coefficient for ideal and Van der wall gases.	05
	c) Discuss the energy distribution of black body.	04

