Q.P. Code: 16ME8801 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

M.Tech I Year I Semester (R16) Regular Examinations December 2016

ADVANCED THERMODYNAMICS

(Thermal Engineering)

(For Students admitted in 2016 only)

Time: **3 hours** Max. Marks: **60**

(Answer all Five Units **5 X 12 =60** Marks)

UNIT-I

Q.1 A constant volume chamber of 0.3m^3 capacity contains 1 kg of air at 5^{0}C. heat is transferred to the air until the temperature is 100^{0}C. Find the following

(a) Work done, Heat transferred. 4M

(b) Change in Internal energy, enthalpy. 4M

(c)Entropy and initial pressure. 4M

OR

Q.2 a. Explain Maxwell relations. 8M

b. Define thermodynamic potentials 4M

UNIT-II

Q.3 a. From an experimental determination the specific heat ratio for acetylene (C_2H_2) is found to 1.26. Find the two specific heats. 4M

b. A certain gas has C_p= 0.93 and C_v = 0.653 KJ/KgK. Find the molecular weight and gas constant® of the gas. 4M

c. Difference between Ideal gas and real gas. 4M

OR

Q.4 a. Explain Dalton's law of partial pressure. 6M

b. Explain Gibbs phase rule. 6M

UNIT-III

Q.5 Discuss the following.

(i) Adiabatic flame temperature. 6M

(ii)Entropy of formation. 6M

OR

Q.6 a. A fuel contains by mass 88%C, 8% H_2, 1% S and 3% ash (silica). Calculate the stoichiometric air. 8M

b. Define Enthalpy of formation 4M

UNIT-IV

Q.7 a. What is the difference between reversible and irreversible process. 6M

b. What are the causes of irreversibility explain briefly. 6M

OR

Q.8 a. Write short notes on thermoelectric materials. 6M

b. A reversible heat engine receives 650KJ of heat at 600^{0}C and has an efficiency of 65%. Calculate work out put and the temperature at which heat is rejected. 6M

UNIT-V

Q.9		Write short note on:	
		(i) See back effect	4M
		(ii) Joule effect	4M
		(i) Peltier Effect	4M
		OR	
Q.10	a.	What are the advantages and disadvantages of fuel cells.	4M
	b.	Discuss Photovoltaic cell.	8M

***** END *****