Code No: I2102/R16

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M. Tech. I Semester Regular Examinations, December-2016
ADVANCED THERMODYNAMICS
Common to Thermal Engineering (21)

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

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Answer any FIVE Questions
All Questions Carry Equal Marks

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1.	a	Explain mechanical, thermal and chemical irreversibilities.	6
	b	80 kg of water at 100°C are mixed with 50 kg of water at 60°C, while the temperature of the surroundings is 15°C. Determine the decrease in available energy due to mixing.	6
2.	a	What are different laws of thermodynamics? Explain them along with the properties developed based on these laws.	6
	b	Write short notes on Psychrometric chart.	6
3.	a	Find the change of entropy of a gas following Clausius equation of state at constant temperature **p(v-b) = RT**	10
	b	What is the use of the Gibbs entropy equation?	2
4.	a	Explain about Mayer's relation and Specific heat relations.	6
	b	Explain the Thermo electric circuits.	6
5.	a	Gaseous butane at 25 °C is mixed with air at 400K and burned with 400% theoretical air. Determine the adiabatic flame temperature.	6
	b	Explain the applications of Gouy-Stodola equation.	6
6.	a	Discuss the importance of Onsaga relations in evaluating the irreversibilities for coupled flows.	7
	b	What is fuel cell? Explain its working principle.	5
7.	a	Derive any two of the Maxwell's relations	6
	b	What is thermionic emission effect? How space charge effect is minimized?	6
8.		**Write Short Notes on**	
	a	Entropy Generation	4
	b	Gibbs phase rule	4
	b	Clausius-Clapeyron equation	4

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