★★★★★ SGU	**Sanjay Ghodawat University, Kolhapur** Established as State Private University under Govt. of Maharashtra. Act No XL, 2017		2018-19 EXM/P/09/01
Year and Program: SY B. Tech	**School:** Technology		**Department:** Mechanical Engg.
Course Code: AET205	**Course Title:** Aero Thermodynamics		**Semester:** III
Day and Date: Friday 14-06-2019	**End Semester Examination (ESE)**		**Time:** Max Marks: 100 2.30 to 5.30 pm. 3 Hrs.

Instructions:
1. All questions are compulsory.
2. Assume suitable data wherever necessary.
3. Figures to the right indicate full marks.
4. Use of thermodynamic data handbook and steam table is permitted.

			Marks	Bloom's Level	CO
Q.1		**Attempt the following**			
	a)	A thermocouple with a test junction at t∘C on a gas thermometer scale gives the emf as $e = 0.22t - 5.5 \times 10^{-4} t^2$ mV. The millivoltmeter is calibrated at ice point and steam points. What will be the reading on this thermometer, when the gas thermometer reads 60°C?	06	L_2	CO1
		OR			
	a)	The thermometer scale of a certain thermometer is given by the relation, $t = A \ln p + B$, where A and B are constants and p is the thermometric property of the fluid in the thermometer. At ice point and steam point, if the thermometric property is found to be 1.5 and 7.5 respectively, what will be the temperature corresponding to the thermometric property of 3.5 on Celsius scale?	06	L_2	CO1
	b)	State the first law of thermodynamics for cyclic process and write its applications.	06	L_2	CO2
		OR			
	b)	Derive Steady state energy equations with its assumptions.	06	L_2	CO2
Q.2		**Attempt the following.**			
	a)	Explain with suitable examples various types of fuels with respective advantages and disadvantages.	06	L_1	CO3
		OR			
	a)	Explain the basic consideration of fuel choice with suitable examples.	06	L_2	CO3
	b)	With suitable sketch, discuss the difference between heat engine, heat pump and refrigerator.	06	L_2	CO4
		OR			
	b)	Describe Kelvin Plank and Clausius statements and their equivalences.	06	L_2	CO4

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Q.3		**Solve any Two.**			
	a)	Write a note on Zeroth law of Thermodynamics.	08	L₃	CO1
	b)	With suitable example, differentiate between flow process and non-flow process.	08	L₃	CO2
	c)	Explain the following:	08	L₃	CO3

      1. Stoichiometric AFR.

      2. Spontaneous ignition.

	d)	Explain Carnot cycle with the help of P-V and T-s Diagram.	08	L₃	CO4
Q.4		**Solve any Two.**			
	a)	What is Entropy? Explain with neat sketch Clausius Theorem.	09	L₂	CO5
	b)	State Clausius inequality and show that entropy as a property of the system.	09	L₃	CO5
	c)	Explain Entropy change during irreversible process.	09	L₁	CO5
Q.5		**Solve any Two.**			
	a)	Explain with neat sketch Vapour compression refrigeration cycle with P-h Diagram.	09	L₂	CO6
	b)	Explain with neat sketch Otto cycle.	09	L₂	CO6
	c)	Explain with neat sketch aqua ammonia Vapour absorption refrigeration cycle.	09	L₂	CO6
Q.6		**Solve any Three.**			
	a)	Show that Tds=dH-Vdp	08	L₂	CO5
	b)	Explain entropy change for solid and liquid with suitable examples.	08	L₂	CO5
	c)	Explain Tons of Refrigeration and Coefficient Of Performance for a refrigeration system.	08	L₂	CO6
	d)	Explain with neat sketch Rankin's cycle.	08	L₂	CO6

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