Q.P. Code: **16ME8804** **R16**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year I Semester Regular & Supplementary Examinations February 2018
Fuels, Combustion & Environment
(Thermal Engineering)

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

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

UNIT-I

1	a.	Explain briefly the properties of bituminous and lignite coals?	6M
	b.	Explain analysis of coal and its uses?	6M
		OR	
2	a.	What are the advantages and disadvantages of liquid fuels over solid fuels?	6M
	b.	What is CNG? Write about applications of CNG?	6M

UNIT-II

3	a.	What are the factors affecting the rate of reaction?	6M
	b.	What is adiabatic combustion process? Explain with the help of H- T diagram?	6M
		OR	
4	a.	Explain the second law of thermodynamics applied to combustion?	6M
	b.	Discuss about the oxidation behavior of hydrocarbons	6M

UNIT-III

5	a.	Define (i) enthalpy of formation (ii) internal energy of combustion and (iii) enthalpy of combustion	6M
	b.	Determine adiabatic flame temperature when liquid at 25^{o}C with 300% theoretical air at 25^{o}C in a steady flow process.	6M
		OR	
6	a.	For a natural gas with a molar analysis of 86.5% CH_4, 8% C_2H_6, 2% C_3H_8, 3.5% N_2, determine the lower heating value, in kJ per kmol of fuel and in kJ per kg of fuel, at 25^{o}C, 1 atm.	6M
	b.	What are the factors affecting the burning velocity?	6M

UNIT-IV

7	a.	What do you mean by transition zone of combustion?	6M
	b.	Isooctane is supplied to a 4 cylinder SI engine at 2 g/sec. Calculate the air flow rate for stoichiometric combustion?	6M
		OR	
8	a.	What are the advantages of Circulating fluidized bed combustion over Pulverized fuel combustion?	4M
	b.	What are the different types of gasifiers? Explain briefly their characteristics.	8M

UNIT-V

9	a.	What are the advantages of gas burners?	4M
	b.	Explain briefly about the flame stabilization with neat diagram?	8M
		OR	
10	a.	Explain briefly the working principle of vaporizing burner with a neat figure	6M
	b.	Write about applications of oil burners?	6M

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