Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year I Semester (R16) Regular Examinations January 2017
FUELS, COMBUSTION & ENVIRONMENT
(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. What are the characteristics of solid fuels?   6M
       b. What are the liquids fuels and how can they be grouped?   6M

OR

Q.2 a. Explain the classifications of petroleum based fuels?   6M
       b. Explain the techniques used for the production of biogas.   6M

UNIT-II

Q.3 a. Define the combustion reaction and explain briefly third order
           reaction   6M
       b. Explain what do you understand by kinetically controlled reaction   6M

OR

Q.4 a. Explain diffusion zone and kinetic zone.   6M
       b. Explain why carbon monoxide is formed predominately on the
           surface of burning carbon particles.   6M

UNIT-III

Q.5 a. Explain the physical and chemical factors determining the
           combustion rate of a fuel.   6M
       b. Explain what you understand by adiabatic flame temperature.   6M

OR

Q.6 a. Calculation the higher heating value and lower heating value of n-
           pentane C_5H_{12} at 25^0C.   6M
       b. How is a fuel enthalpy of combustion connected to its enthalpy
           formation?   6M

UNIT-IV

Q.7 a. Explain briefly the methods used to analyze the flue gases   8M
       b. What are the varies regimes of fluidization?   4M

OR

Q.8 a. Briefly explain the sequence of events of burning of fuel particles in a
           fluidized bed.   6M
       b. Explain briefly the Orsat analyzer with neat diagram.   6M

UNIT-V

Q.9 a. Explain briefly the working principle of atmospheric gas burner with a neat figure. 8M
       b. Explain the differences between gas burners and oil burners 4M

OR

Q.10 a. Write the important factors effecting the flame structure 4M
        b. What is the two fluid atomization and explain with a neat figure 8M

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