Thermodynamics and Combustion Laboratory

The graphs to be plotted are mentioned below. Please ensure that your discussion includes, but need not be limited to the following.

Experiment 1: Flame Speed Propagation

Plot: 1) Flame Speed versus Air/Fuel Ratio 2) Air/Fuel Ratio versus Burner Loading

Q1. Explain the phenomena of 'Flash Back' and 'Lift Off'. What forces are at play?

Q2. What is the importance of studying the Flame propagation speed and Flame stability?

Q3. What precautions would you recommend to perform the experiment safely and accurately? (Please be brief)

Experiment 2: Fluidized Bed

Plot: Heat transfer coefficient versus Superficial Velocity

Q1. What is a fluidized bed? How does it affect heat transfer?

Q2. What is superficial velocity?

Q3. What is the variation of heat transfer coefficient with increasing superficial velocity? Does the trend remain the same indefinitely? Explain.

Experiment 3: Air entrainment into an IRS device

Plot: Mass Entrained versus Mass Entering the device

Q1. What is an IRS device? Where is it used?

Q2. Explain the principle of working of the IRS device that you have used in the experiment.