Register Number

M.E DEGREE EXAMINATIONS APRIL / MAY 2012
SECOND SEMESTER
BRANCH : ENERGY ENGINEERING
EEG507 : INSTRUMENTATION FOR THERMAL SYSTEMS

Time : 3 Hrs **Maximum Marks : 100**

Answer ALL Questions
PART – A (10 X 2 = 20 Marks)

1. What are the causes for random error in a measurement ?
2. What do you mean by uncertainty in an experimental observation ?
3. Write the application of data acquisition system.
4. What are the factors that decide the configuration and subsystem of data acquisition system ?
5. What is Seebeck effect ?
6. Name the various methods for flow measurement.
7. What is meant by telemetry systems ?
8. Define Schlieren effect in flow visualization.
9. List any three techniques for particulate measurement.
10. Name any three types of gas sampling techniques

PART – B (5 X 16 = 80 Marks)

11. a. Discuss the following basic characteristics of instruments. (8 X 2 = 16)
    - i) Accuracy
    - ii) Precision
    - iii) Linearity
    - iv) Hysteresis
    - v) Threshold
    - vi) Resolution
    - vii) Dynamic accuracy
    - viii) Calibration of instruments

Or

b. Enumerate the various sources of errors encountered in a measurement system with examples.

12. a. With the help of a schematic sketch, explain the general data acquisition system.

Or

b. Explain the elements of microcomputer that is used in intelligent instruments.

13. a. Illustrate in detail the working principle and applications of the following temperature measuring devices :
    - i) Optical pyrometer (8)
    - ii) Thermocouples and thermistors. (8)

Or

b. With neat sketches, explain any two positive displacement methods for flow measurement.

14. a. Write short notes on

i) Interferometer (8)

ii) Shadowgraph (8)

Or

b. i. Describe the working of Laser Doppler anemometer (8)

ii. Explain the functioning of Gordon heat flux meter (8)

15. a. Explain the measurement of combustion products by Orsat apparatus.

Or

b. Describe the colorimetry analysis process of sulphur di-oxide.