APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER M.TECH DEGREE EXAMINATION, DECEMBER 2015

Mechanical Engineering

(Thermal Engineering)

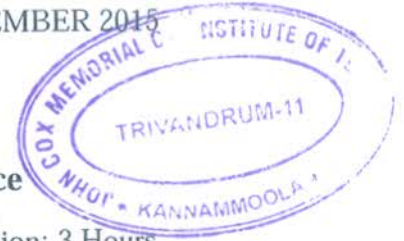**01ME6507 Measurements in Thermal Science**

Max. Marks : 60   Duration: 3 Hours

Part A   (2x9 = 18)

1. (a) Explain the static and dynamic characteristics of a measuring instrument.   5
    (b) Differentiate between the working of thermoelectric thermometer and resistance
    thermometer.   4

2. (a) Discuss the different types of errors in measurement.   5
    (b) How pyrometer can be employed for measuring temperature.   4

3. (a) Explain the importance of regression analysis in the analysis of experimental data. 5
    (b) Briefly explain the types of heat flux meters used for heat flux measurement.   4

Part B   (2x9 = 18)

4. (a) Discuss different types of mechanical devices for measuring pressure.   5
    (b) With a neat sketch explain the working of guarded hot-plate apparatus.   4

5. (a) How Pitot tube can be used for mapping velocity.   5
    (b) Discuss the measurement of humidity and moisture using thermometers.   4

6. (a) Explain the working of hot wire anemometer with the help of a flow
    measurement circuit.   5
    (b) With a neat sketch explain the working of orsat apparatus used for analyzing
    products of combustion.   4

Part C   (2x12 = 24)

7. (a) Explain the principle and application of PIV.   6
    (b) Discuss the key elements in a general data acquisition system.   6

8. (a) Differentiate between Rayleigh scattering and Raman scattering.   6
    (b) Explain A/D and D/A converters for data transmission.   6

9. (a) Briefly explain the applications of Laser Induced Fluorescene in
    species concentration.   6
    (b) Mention the importance of signal conditioning in data processing systems.   6