Con. 3633-11   (REVISED COURSE)   RK-2622

(3 Hours)   [Total Marks : 100]

N.B. : (1) Question No. 1 is **compulsory**.
  (2) Attempt any **four** questions out of remaining **six** questions.
  (3) Assume **suitable** data wherever **required**.
  (4) Illustrate answer with sketches wherever required.
  (5) **Figures** to the **right** indicate **full** marks.

1. (a) What are the characteristics of Instrument ? Explain any four characteristics. 5
   (b) Explain classification of transducer. 5
   (c) What is need of signal conditioning ? Explain D.C. signal conditioner with neat 5
       block diagram.
   (d) Explain any one control value and electric actuator. 5

2. (a) What are types of error ? Explain in detail. 10
   (b) Explain capacitive transducer for displacement measurement. Derive its 10
       expression. State its advantages and disadvantages.

3. (a) Explain any one method of temperature measurement. Draw the diagram and 10
       explain advantages and disadvantages of the selected transducer. Write its output
       voltage equation.
   (b) Explain strain gauge transducer. Derive its gauge factor. What are bounded and 10
       unbounded strain gauges and also explain advantages and disadvantages of
       semiconductor strain gauge.

4. (a) Explain window comparator with one industrial example. 10
   (b) What are the advantages of instrumentation amplifier ? Explain three op-amp 10
       instrumentation amplifier. Derive its output voltage equation.

5. (a) Explain multichannel data aquisition system to monitor temperature, air pressure, 10
       flow, displacement measurement.
   (b) Explain any one PC-based instrumentation system. 10

6. (a) What are the advantages of continuous controller ? Explain electronics P, PI, 10
       PID controller with neat diagram. Also write its output voltage equation.
   (b) What is cascade controller ? Explain one example of cascade controller. 10

7. (a) What is need of Instrument calibration ? Explain five point calibration procedure. 8
   (b) Write a note on Data logger. 6
   (c) Explain generalised instrumentation system in short. 6