Branch: E&TC Eng.

F.M.: 70   Time 3 hrs.

Answer any five questions from the following

1(a) What is "Standard"? How an international standard can become a local standard?

(b) Explain in detail the different types of error those occurs in electronic measurement and explain how these errors are minimized.

[(1+5)+ 8]

2(a) What is a transducer? How it can be classified? Write down the different characteristics of a transducer.

(b) Prove that for a strain gauge the gauge factor $K = 1 + 2\mu$, where μ is the Poison;s ratio.
        A resistance strain gauge with a gauge factor of 2 is cemented to a steel member, which is subjected to a strain of 10^{-6}. If the original resistance value of the gauge is 130Ω. Calculate the change in resistance.

[(1+1+3)+(7+2)]

3. With a neat schematic explain the operation of a LVDT and mention its drawback. Suggest a scheme with a simplified diagram to measure the pressure of air by using LVDT.

[6+2+6]

4. (a) How a shunt type ohmmeter differs from a series type (normal type) and also mention its specific application.

(b) Draw the circuit of milli-ammeter section of a multi-meter and explain its operation. Also mention the necessary change in the circuit when it will measure current in the range of micro-meter.

[(4+1)+ (6+3)]

5(a). How a function generator differs from a signal generator? With a neat schematic explain the operation of a function generator.

(b) Explain with a neat schematic the operation of a digital tachometer.

[(2+6) +6]

6. How a dual trace CRO differs from a dual beam CRO? What do you mean by 'ALT' and 'CHOP' mode display? Explain different methods for triggering a CRO. Explain the role of delay line in the vertical path of a CRO.

[4+4+4+2]

7. With a neat schematic explain the operation of a digital storage oscilloscope (DSO). What do you mean by 'zooming', 'math operation' and 'z-axis' related to a DSO.
        Also explain the technique for measurement of phase of a signal by using Lissajous technique.

[(7+3)+ 4]

8. Write short notes on any two of the following: [7×2 = 14]
(a) Spectrum Analyzer.
(b) Platinum resistance thermometer.
(c) Microprocessor based temperature controller.
(d) Different types of display.