

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Textile) (2011 Onwards) (Sem.-3)
ELEMENTS OF INSTRUMENTATION AND CONTROL
ENGINEERING

Subject Code : BTTE-305

Paper ID : [A2744]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**Q1 Answer briefly :**

- a) What is meant by data acquisition?
- b) Mention the significance of measurements.
- c) What are the advantages of digital instruments over analog instruments?
- d) Why do we use a multiplier with a voltmeter?
- e) What is piezoelectric effect?
- f) What are active and passive transducers? Give examples.
- g) Why is scale of MI instrument calibrated non-linearly?
- h) Define electrical transducers and its feature.
- i) Is piezoelectric transducer active or passive? Give reason.
- j) Define the following terms as applied to an electronic instruments:
 - i) Accuracy
 - ii) Resolution.

SECTION-B

Q2 Derive the transfer function of the network shown in fig 1.

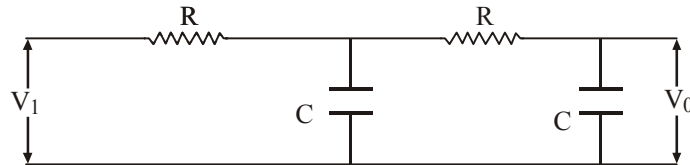


Figure - 1

Q3 Explain construction, principle and operation of LVDT. Show characteristics curves.

Q4 Check the stability of the system whose characteristic equation is $s^4+2s^3+6s^2+4s+1=0$

Q5 Obtain the unit step response of feedback system whose open loop transfer function is

$$G(s) = \frac{4}{s(s+5)}$$

Q6 Describe the basic principle of operation of D.C potentiometer. Explain why a potentiometer does not load the voltmeter source whose voltage is being determine.

SECTION-C

Q7 Find the transfer function of the system shown in figure 2.

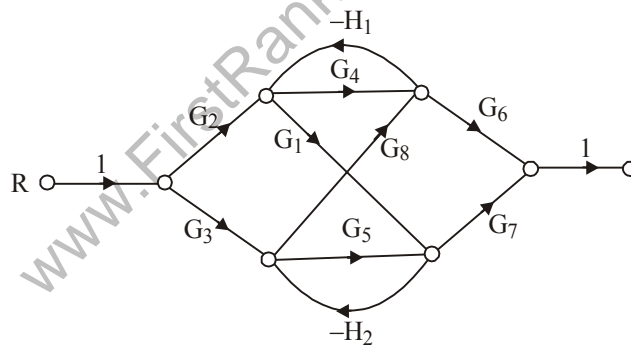


Figure - 2

Q8 Determine the position, velocity, and acceleration error constants for the unity feedback control system whose open-loop transfer function is given below.

$$\frac{10}{(1+0.4s)(1+0.5s)}$$

Q9 Describe the construction and working of permanent magnet moving coil (PMMC) instrument. Derive the equation for deflection if the instrument is spring controlled. Describe the method of damping used in these instruments.