Roll No. ☐☐☐☐☐☐☐☐☐☐☐   **Total No. of Pages : 02**

Total No. of Questions : 09

B.Tech.(Textile Engg.) (2011 Onwards) (Sem.–3)
ELEMENTS OF INSTRUMENTATION AND CONTROL ENGINEERING
Subject Code : BTTE-305
M.Code : 71657

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) Mention the significance of measurements.

(b) Compare Moving coil with Moving iron instruments.

(c) List the steps involved in obtaining the transfer function.

(d) Define peak overshoot and settling time.

(e) What is meant by balanced condition for Wheatstone bridge?

(f) Name the two types of electrical analogous for mechanical system.

(g) Give the advantages and disadvantages of open loop system.

(h) Give the properties of signal flow graph.

(i) What is transient response?

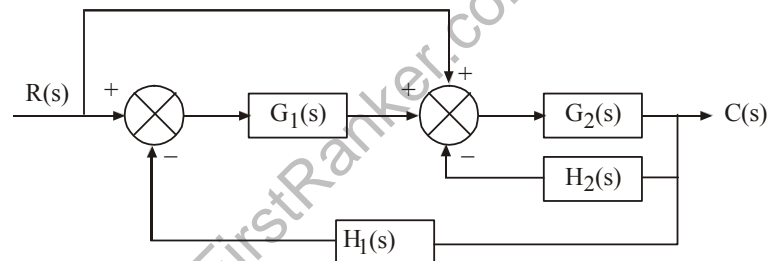(j) Discuss basic characteristics of measuring devices.

SECTION-B

Q2.   Explain the difference between systematic and random errors. What are the typical sources of these two types of error?

Q3.   Explain the working operation for PMMC & derive it's torque equation.

Q4.   Discuss briefly the constructional details of a self-balancing potentiometer.

Q5.   Check the stability of the system whose characteristic equation is

$$q(s) = 3s^4 + 10s^3 + 5s^2 + 5s + 2$$

Q6.   Design an Ayrton shunt to provide an ammeter with current ranges of 1 A, 5 A and 10 A. A basic meter with an internal resistance of 50 Ω and a full scale deflection current of 1 mA is to be used.

SECTION-C

Q7.   Draw an equivalent signal flow graph for the block diagram shown in figure 1 and find the transfer function C(s)/R(s).

Fig.1

Q8   (a) Discuss basic characteristics of measuring devices.

        (b) Define passive and active transducers and given an example of each.

Q9.   Write short notes on the following :

        (a) Mathematical Modelling of textile processing.

        (b) Steady state error in the control system.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.