B.Tech.(ECE) (E-I 2012 to 2017)   (Sem.–6)

INTELLIGENT INSTRUMENTATION
Subject Code : BTEC-906
M.Code : 71235

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

1. **Answer briefly :**

    a) What do you mean by resolution of a converter?

    b) What is difference between DAS and a data logger?

    c) What is an I to P converter?

    d) Name different types of timers used in PLC.

    e) What is a model predictive control?

    f) What are some advantages of SCADA over other protocols?

    g) What is double-acting pneumatic cylinder?

    h) How is expert controller better than conventional controller for a specific application?

    i) What do you mean by resolution of a signal converter?

    j) How model based controllers are designed for a process control system?

SECTION-B

2. With a neat sketch discuss the PLC network that is used for communication of plant parameters in a process control environment and monitoring. How the control algorithm is developed in intelligent control?

3. Prove the Fuzzy DeMorgan law.

   a) $A \bigcap A^C = (A^C \bigcup B^C)^C$

   b) $A \bigcup A^C = (A^C \bigcap B^C)^C$

4. Explain how the ANN can be used for process identification with neat sketch.

5. Discuss the working of I-P converter with the help of suitable diagram.

6. A sensor provides temperature data as 360 mV/ °C. Develop a comparator circuit that goes high when temperature reaches 350°C.

SECTION-C

7. Explain with sketch and block diagram, a direct digital control (DDC) system used for a chemical process.

8. Draw a circuit diagram for sample and hold circuit using an operational amplifier and discuss its working. A Sample/Hold circuit settles to within 1 percent of its final value at 5μs. What is the maximum resolution and speed with which an ADC can use this data assuming that the ADC is ideal?

9. Assuming XI, X2 & X3 to be three limit switches with normally open contact and C1, C2 & C3 be the limit switches with the normally closed contact. Form at least three-ladder diagram to energize a coil using OR-AND circuit. How can you provide interfacing operations?

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.