**B.E. DEGREE EXAMINATIONS: NOV/DEC 2010**

Seventh Semester

**ELECTRONICS AND INSTRUMENTATION ENGINEERING**

U07EI702: Computer Control of Process

**Time: Three Hours** **Maximum Marks: 100**

**Answer ALL Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. _____ method is used for inverting the Z-transform.

   a) Substitution   b) Partial fraction expansion   c) Short division  d) Complex translation

2. $F(t) = 0$   $t < 0$ ,   $e^{-at}$   $t \geq 0$ represents,

   a) Ramp function   b) sine function   c) Exponential function   d) unit step function

3. $\frac{c(z)}{R(z)} = z^{-1}$ specified a condition to be satisfied for

   a) Dahlin's algorithm                    b) Kalman's algorithm

   c) Deatbeat's algorithm                  d) Smith predictor algorithm

4. _____ algorithm specifies that closed loop sampled data control system behaves as though it were a first order process with dead time.

   a) Dahlin's algorithm                    b) Kalman's algorithm

   c) Deatbeat's algorithm                  d) Smith predictor algorithm

5. Industrial process generally require_____ controllers.

   a) predictive      b) pole placement       c) multiloop         d) cascade

6. The acronym for SCADA is

   a) supervisory control and data acquisition    c) smart control and data analyzer

   b) secured control and data acquisition         d) smart card and data automation

7. The most common PLC language is _____

   a) Pascal    b) assembly language      c) ladder diagram        d) Prolog

8. _____ maintains the current time when power is removed from the device.

   a) retentive timer   b) off-delay timer   c) cascading time   d) on-delay timer

9. To reduce the processor scan time _____ type instructions can be used.

   a) MCR            b) SI                c) ZCL               d) JMP

10. Event driven sequencer functions are similar to _____ instructions.

   a) timer            b) interrupt            c) counter            d) jump

**PART B (10 x 2 = 20 Marks)**

11. Define sampling.

12. What are the methods used for inverting z-transform?

13. What are all the specifications reached through deadbeat's algorithm?

14. State the condition to be satisfied for kalman's algorithm.

15. What are the basic building blocks of computer control system?

16. Draw the block diagram of the expert control system.

17. What are the advantages of using PLC?

18. Distinguish between sequential and combinational control process.

19. List any four Math instructions.

20. What are the applications of PLC?

## PART C (5 x 14 = 70 Marks)

21. a) (i) Explain briefly about the sampling process. (7)

    (ii) Elaborately discuss the process of development of the pulse transfer function. (7)

**(OR)**

    b) (i) Determine z-transform of cos wt. (7)

    (ii) Explain briefly about Jury's stability test. (7)


22. a) (i) Explain in detail about Kalman's algorithm. (8)

    (ii) Write a note on predictive controller. (6)

**(OR)**

    b) (i) Design the dead beaf controller for a first order process $G_p(s) = \dfrac{2}{(0.7s+1)}$?


23. a) Explain in detail about the data acquisition systems with a neat sketch.

**(OR)**

    b) Explain in detail about SCADA system's architecture and functions.


24. a) Discuss in detail about the components of PLC.

**(OR)**

    b) (i) How will you convert a relay ladder diagrams into PLC ladder programs? (8)

    (ii) Explain briefly about up and down-counters. (6)


25. a) Explain with examples about the program control instructions.

**(OR)**

    b) Discuss the use of PLC in the bottle filling system plant.

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