**Reg. No. \_\_\_\_\_\_\_\_**

**Karunya University**

**(Karunya Institute of Technology and Sciences)**

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination - June 2011**

**Subject Title: DIGITAL CONTROL SYSTEMS Time: 3 hours**

**Subject Code: EI214 Maximum Marks: 100**

#### **Answer ALL questions**

**PART – A (10 x 1 = 10 MARKS)**

1. Give the operation performed by A/D converter.

2. What is z-1 of ?

3. Steady state error for unit ramp type 1 system is \_\_\_\_\_\_\_\_\_\_.

4. If there is a repeated root on the unit circle, the system is \_\_\_\_\_\_\_\_\_\_.

5. Cayley Hamilton theorem is every matrix satisfies its own \_\_\_\_\_\_\_\_\_\_.

6. State transition equation describes the change of state relative to \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_.

7. For dead beat response the system must have \_\_\_\_\_\_\_\_\_\_ steady state error.

8. Ringing poles are at Z= \_\_\_\_\_\_\_\_\_\_.

9. Give the general block of digital control.

10. Give the basic functions of SCADA.

**PART – B (5 x 3 = 15 MARKS)**

11. Give the circuit of Three bit D/A converter.

12. What are the factors that affect the choice of sampling rate?

13. What is pulse transfer function?

14. Give the inference of input quantization error.

15. What is holding torque in stepper motor?

**PART – C (5 x 15 = 75 MARKS)**

16. Discuss the filtering requirements in digital control applications.

(OR)

17. Explain successive approximation ADC in detail.

18. Check the stability of the system using Jury stability Test.

(OR)

19. a. Explain the stability analysis using Bilinear Transformation

b. Analyse the stability of the following system using bilinear transformation:

20. Give three different canonical state variable models for the transfer function

(OR)

21. A feedback system has a closed loop transfer function . Construct three different state models for this system.

[P.T.O]

22. Discuss the Dahlin’s algorithm in detail.

(OR)

23. Explain Kalman’s algorithm in detail.

24. Explain digital Temperature Control System in detail

(OR)

25. Describe the operational features and interfacing of stepper motors to microprocessors.