

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- VI (New) EXAMINATION – WINTER 2019

Subject Code: 2160807

Date: 13/12/2019

Subject Name: Digital Control System

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a) Explain the various Advantages offered by Digital Control. 03
 (b) Explain Distribution Signal Rejection. 04
 (c) Explain Open Loop & Close Loop Control system with Block diagram. 07

- Q.2 (a) Explain the process of Signal conversion and coding. 03
 (b) Explain Practical Sample and Hold Circuit. 04
 (c) Comparison between digital Control System & analog control system with block diagram. 07

OR

- (c) Explain the Z-Domain Description of System with Dead Zone with Necessary Equation. 07
 Q.3 (a) Explain the Invariance property of a state variable system. 03
 (b) Explain Mathematical Modeling of Sampling Process. 04
 (c) Explain Unit Sample Sequence and Unit Step Sequence. 07

OR

- Q.3 (a) Compare Proportional -Integral controller & Proportional Controller. 03
 (b) Explain the Eigen Values and Eigen Vectors of a System. 04
 (c) Explain the design Specification & configuration of basic digital control system. 07
 Q.4 (a) Define following terms. 03
 1) State Vector. 2) State Space. 3) State Trajectory.
 (b) Explain Block Diagram of Digital Positioning System. 04
 (c) Explain the state variable analysis for a Multi-Variable system. 07

OR

- Q.4 (a) Explain BIBO stability in detail. 03
 (b) Explain Tunable PID Controller. 04
 (c) Explain the reconstruction of analog signal. 07
 Q.5 (a) Steady state error for various input and output system. 03
 (b) Explain Properties of Z-transform any one. 04
 (c) Write a Short note on Digital Temperature Control System.. 07

OR

- Q.5 (a) Explain the Controllability and Observability 03
 (b) Explain the relation between transfer function and state space model for a discrete time system. 04
 (c) Design Phase Lag compensator using root locus plot. 07
