

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VIII • EXAMINATION – WINTER • 2014

Subject Code: 180908**Date: 25-11-2014****Subject Name: Advanced Processor and Controller****Time: 02:30 pm - 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 on-delay timer, off-delay timer and retentive timer with diagram and waveform of each. **07**
- (b)** Explain GPIO functionality of LF2407. **07**
- Q.2 (a)** Describe and explain the block diagram of PLC and scan-cycle of PLC. **07**
- (b)** How the PLC differs from the microcontroller? **07**
- OR**
- (b)** Explain all the peripherals of LF2407. **07**
- Q.3 (a)** Explain the meaning of 'UP-ROOTS' and 'RUNGS' in a ladder diagram. **07**
- (b)** Explain the down counter, up counter and up-down counter of PLC with appropriate example. **07**
- OR**
- Q.3 (a)** Explain the memory addressing modes of LF2407 DSP with example. **07**
- (b)** Draw the architecture of TMS320LF2407 controller. **07**
- Q.4 (a)** Explain input and output module of PLC with appropriate layout. **07**
- (b)** Explain sequence of steps for serving an interrupt in TMS320LF2407 Controller. **07**
- OR**
- Q.4 (a)** Explain the different digital signal systems in detail. **07**
- (b)** Draw the ladder diagram for instant forward and reverse of motor with interlocking. List out the input and output required for the programme. **07**
- Q.5 (a)** Find the Z-transform of (i) $x(n) = \cos \omega_0 n$ for $n \geq 0$ and (ii) $x(n) = 2^n \cdot u(n-2)$ **07**
- (b)** (i) Check whether the following systems are linear or nonlinear. **04**
- (i) $y(t) = 5 \sin x(t)$ and (ii) $y(t) = 7x(t) + 5$
- (ii) Check whether the following systems are linear and time invariant. **03**
- (i) $F[x(n)] = a[x(n)^2] + bx(n)$
- OR**
- Q.5 (a)** (i) Determine the impulse response for the system given by the following difference equation. **04**
- (i) $y(n) + 3y(n-1) + 2y(n-2) = 2x(n) - x(n-1)$
- (ii) Determine the convolution of the two sequence $x(n) = \{2, 1, 0, 0.5\}$ and $h(n) = \{2, 2, 1, 1\}$. **03**
- (b)** Describe the important properties of the ROC for the z-transform. **07**
