Seat No.: _____ Enrolment No._____

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) $x(n)=2^n.u(n-2)$	**07**
	(b)	(i) Check whether the following systems are linear or nonlinear. (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. (i) $F[x(n)]=a[x(n)^2] + bx(n)$	**04** **03**
		OR	
Q.5	**(a)**	(i) Determine the impulse response for the system given by the following difference equation. (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 $h(n)=\{2,2,1,1\}$.	**04** **03**
	(b)	Describe the important properties of the ROC for the z-transform.	**07**

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