Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2160307 **Date: 01/05/2017**

Subject Name: Embedded system Design

Time: 10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

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

MARKS

Q.1 Short Questions **14**

1 An 8 bit ADC breaks the given voltage range in how many parts?

A 256 **B** 1024 **C** 128 **D** 0

2 Which register is used for Timer 0 programming?

A T0CON **B** OPTION_REG **C** CCP0CON **D** T0SET

3 PIC16F877 has ____ I/O PORTS.

A 4 **B** 5 **C** 3 **D** 6

4 What is the resolution of 8 bit ADC? Assume reference voltage is 5 Volt.

A 19.6 mV **B** 19.6 V **C** 4.88 mV **D** 4.88 V

5 Which SFR is used for Brown-out Reset Status?

A PIE1 **B** PIR1 **C** PCON **D** T1CON

6 Which SFR is used to set pre-scaler of Timer 1?

A TMR1H **B** TMR1L **C** T1SET **D** T1CON

7 What is the Post Scaler value of Timer 2, if T2CON=0x7F?

A 1:15 **B** 1:16 **C** 1:256 **D** 1:4

8 Which one is PORTB Data Direction Register?

A PORTB **B** TRISB **C** None **D** Both A and B

9 Which feature is incorrect for PIC16F877?

A DC – 20 MHz operating frequency **B** 2 Timers facility **C** 8 input channels ADC **D** 2 Capture/ Compare/ PWM modules

10 Define BOR.

11 Define WDT.

12 Define PWRT.

13 Define Oscillator Start-up Timer (OST)

14 Define Power-on Reset (POR).

Q.2	**(a)**	Explain TRISB in detail.	**03**
	(b)	Define Embedded system and explain classification of embedded system with examples.	**04**
	(c)	Explain Architecture of PIC16F877 microcontroller.	**07**
		OR	
	(c)	Explain PIN diagram of PIC16F877 microcontroller in detail.	**07**
Q.3	**(a)**	Explain Block diagram of timer 0 of PIC16F877.	**03**
	(b)	Enlist different SFR used to generate delay using Timer 2 of PIC16F877 and explain any one in detail.	**04**
	(c)	Write a c program to generate square wave with frequency 1 Hz using Timer 1 of PIC16F877.	**07**
		OR	
Q.3	**(a)**	Explain Interfacing Opto-Isolator with PIC16F877.	**03**
	(b)	Explain Parallel & Serial Interfaces of PIC16F877.	**04**
	(c)	Explain different interrupt facility available in PIC16F877 microcontroller.	**07**
Q.4	**(a)**	Explain INTCON SFR in detail.	**03**
	(b)	Explain Interfacing Relay with PIC16F877.	**04**
	(c)	Write a c program to display “HELLO” on 16*2 LCD using PIC16F877 controller.	**07**
		OR	
Q.4	**(a)**	Explain Different applications of Arduino board.	**03**
	(b)	Explain Accelerometer Interfacing using Arduino.	**04**
	(c)	Design Ultrasonic range finder using Arduino.	**07**
Q.5	**(a)**	Explain ADC resolution with example.	**03**
	(b)	Enlist different SFRs used for ADC programming in PIC16F877.	**04**
	(c)	Write a c program to display sensor signal data on LCD using PIC16F877.	**07**
		OR	
Q.5	**(a)**	A switch is connected to pin D0, and LED is connected to pin A0, Write a c program to on LED when switch is pressed Using PIC Controller.	**03**
	(b)	Explain PIE1 and PIR1 SFR of PIC16F877.	**04**
	(c)	Write a C program to generate square wave with frequency 10 Hz and duty cycle 50% using Timer 0 using interrupt method.	**07**

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