

Department of Electronics, Saurashtra University, Rajkot
M.Sc. (Electronics), Semester 04, Paper 14: Embedded Programming using AVR

- Instruction:**
- (1) All question carry equal marks.
 - (2) Figures on right hand side indicate marks.

[Max. Marks: 70]

Q. 1. Answer the following in brief. [Any Seven]

[14]

1. Name the three different groups of the AVR chips.
2. What do RISC and CISC stand for?
3. Give two factors that can affect the delay size.
4. How many fuse bytes are available in ATmega32?
5. How many 'Timers' do we have in the ATmega32? Explain each timer in brief.
6. List some of the interrupt sources in the AVR
7. Which is more expensive, parallel or serial data transfer? Why?
8. Give the two factors that affect the step size calculation.
9. Give two applications for an optoisolator.
10. Which of the PWM modes is preferable for controlling motors?

Q. 2. Answer any two.

[14]

1. Draw the simplified block diagram of an AVR microcontroller and explain in brief.
2. Explain the Atmega32 pins in brief.
3. Explain the AVR family in general.

Q. 3. Answer the following.

[14]

1. Write notes on Data types of AVR microcontroller.
2. Explain the importance of delay in AVR microcontroller.

OR

Q. 3. Answer the following.

[14]

1. Write notes on Timers of AVR.
2. List down the steps to find values to be loaded into the timer.

Q. 4. Answer the following.

[14]

1. Write an AVR C Program to monitor bit 5 of PORT C. If it is 1, make bit 2 of PORT C input; otherwise, change pin 2 of PORT C to output.
2. LEDs are connected to pins of PORT B. Write an AVR C program that shows the count from 0 to FFH (0000 0000 to 1111 1111 in binary) on the LEDs.

Q. 5. Answer the following (any two).

[14]

1. Assume that the INTO pin is connected to a switch that is normally high. Write a program that toggles PORTC.3, whenever INTO pin goes low. Use the external interrupt in level-triggered mode.
2. Write a C program to toggle only the PORTB.4 bit continuously every 70 us. Use Timer0, Normal Mode, and 1:8 prescaler to create the delay. Assume XTAL = 8 MHz.
3. Write note on basics of Serial Communication.
4. Write note on ADC characteristics.