



Seat No. \_\_\_\_\_

**HA-003-1154002**

**M. Sc. (Electronics) (Sem. IV) Examination**

**April - 2023**

**Embedded Programming Using AVR : Paper - XIV**

**Faculty Code : 003**

**Subject Code : 1154002**

Time : 3 Hours / Total Marks : 70

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

- 1** Answer the following in brief : (Any Seven) **14**
- (1) What is an AVR microcontroller?
  - (2) What programming languages can be used for AVR programming?
  - (3) What software tools are used for AVR programming?
  - (4) What is the purpose of the fuse bits in an AVR microcontroller?
  - (5) What is the purpose of a crystal oscillator in an AVR microcontroller?
  - (6) How do you set up the I/Q ports on an AVR microcontroller?
  - (7) What is the difference between input and output pins on an AVR microcontroller?
  - (8) What is the purpose of the AVR header file?
  - (9) What is the purpose of a timer in AVR programming?
  - (10) How do you use interrupts in AVR programming?
- 2** Answer any two : **14**
- (1) Draw the simplified block diagram of an AVR microcontroller and explain in brief.
  - (2) How do you choose the most appropriate programming language for a particular project?
  - (3) How do you use loops in C programming for AVR microcontrollers, such as for loops and while loops? What are some common uses for loops in AVR programming?

- 3** Answer the following: **14**
- (1) What are some common uses for interrupts in AVR programming?
  - (2) Write a C program to toggle an LED connected to a specific pin of an AVR microcontroller.

**OR**

- 3** Answer the following : **14**
- (1) What is the difference between hardware and software interrupts?
  - (2) Write a C program to read the status of a push button connected to a specific pin of an AVR microcontroller.
- 4** Answer the following : **14**
- (1) What is an LCD and how does it work? What are some common type's of LCD displays and how do they differ from each other?
  - (2) What are some common types of timers and how do they differ from each other in terms of functionality and performance?
- 5** Answer the following : (any two) **14**
- (1) Write notes on Data types of AVR microcontroller.
  - (2) Draw and explain matrix keyboard connection to ports.
  - (3) Write a C program to toggle only the Port B.4 bit continuously every second. Use Timer1, Normal mode, and 1:256 pre-scaler to create the delay. Assume XTAL = 8 MHz
  - (4) Assume that the INTO pin is connected to a switch that is normally 'high. Write a program that toggles Port C.3, whenever INTO pin goes low. Use the external interrupt in level-triggered mode.