

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, APRIL - 2025**

MICROCONTROLLERS

[Maximum Marks: 100]

[Time: 3 Hours]

PART-A

[Maximum Marks: 10]

- I. (Answer **all** questions in one or two sentences. Each question carries **2** marks)
1. List the names of different AVR microcontroller family groups.
 2. Write the different AVR data formats.
 3. List the different ports of ATmega32.
 4. Write the instructions of AVR used to enable and clear interrupts globally.
 5. What is the use of MAX232 in AVR? (5 x 2 = 10)

PART-B

[Maximum Marks: 30]

- II. (Answer **any five** of the following questions. Each question carries **6** marks)
1. State the role of Program Counter in executing a program.
 2. Explain logic operations in AVR C with examples.
 3. Write an AVR C program to convert ASCII digits of '3' and '6' to packed BCD and display them on PORTA.
 4. Illustrate Timer0 of AVR with diagram.
 5. Define Interrupt. Explain different steps in executing an interrupt.
 6. Describe asynchronous serial communication in AVR microcontroller.
 7. Write about temperature sensor interfacing with diagram. (5 x 6 = 30)

PART-C

[Maximum Marks: 60]

(Answer **one** full question from each Unit. Each full question carries **15** marks)

UNIT – I

- III. a. Explain data memory organization of AVR with diagram. (9)
b. Write an assembly language program to add five 8-bit numbers stored in memory. (6)

OR

- IV. Explain the architecture of AVR with block diagram. (15)

UNIT – II

- V. a. Write an AVR C program to toggle an LED connected to PORTA pin 2 continuously with a delay function. (8)
- b. List the different data types used in AVR C. (7)

OR

- VI. a. Explain any four bit manipulation commands with examples. (9)
- b. State the different ways to create delay in AVR C. (6)

UNIT- III

- VII. a. Explain the different registers of timers. (9)
- b. Describe the programming of external hardware interrupts in AVR. (6)

OR

- VIII. a. Write the applications of timers in AVR. Write an AVR C program to generate a time delay using timer0. (9)
- b. Describe about interrupt priority in AVR. (6)

UNIT - IV

- IX. Explain working of LCD with pin description and interfacing with AVR. (15)

OR

- X. a. Explain ADC and its major characteristics. (9)
- b. Draw the DAC interfacing diagram. (6)
