

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2020**

MICROCONTROLLERS

[Maximum Marks: 75]

[Time: 2.15 Hours]

PART-A

(Answer *any three* questions in one or two sentences. Each question carries 2 marks)

- I. 1. List the two kinds of memory space in AVR microcontrollers.
2. List the three I/O registers allocated for each port.
3. Name any 4 basic registers of Timer.
4. List the three ways to create a time delay in AVR C programming.
5. List two methods of Serial data communication. (3 x 2 = 6)

PART-B

(Answer *any four* of the following questions. Each question carries 6 marks)

- II 1. Describe the three parts of data memory in AVR.
2. List and describe the data formats in AVR.
3. Explain I/O bit manipulation programming.
4. Differentiate Interrupts and Polling.
5. Describe programming Timer Interrupts.
6. Write a short note on DAC.
7. List the steps to send commands and data to LCD. (4 x 6 = 24)

PART-C

(Answer *any of the three units* from the following. Each full question carries 15 marks)

UNIT – I

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

OR

- IV (a) Explain CALL instruction and Stack in AVR. (8)
(b) Explain the Program counter and Program ROM space. (7)

UNIT – II

- V (a) Explain two Rotate instruction and SWAP instruction with example. (9)
(b) Write AVR C program to get a byte of data from port B and then send to port C. (6)

OR

- VI (a) List the major reasons for writing AVR program in C. (5)
(b) A door sensor is connected to bit 1 of port B & an LED is connected to bit 7 of port C.
Write an AVR C program to monitor the door sensor and when it opens, turn on the LED. (10)

UNIT- III

- VII (a) State and explain the Steps in executing an interrupt. (8)
(b) Draw the Block diagram Timer 1 in ATmega32. (7)

OR

- VIII (a) List the sources of interrupts in the AVR. (6)
(b) State the steps to program Timer0 in normal mode. (6)
(c) List the three external hardware interrupts in the ATmega32. (3)

UNIT - IV

- IX Explain interfacing temperature sensor with AVR with a neat diagram. (15)

OR

- X Explain keyboard interfacing with AVR using a neat diagram. (15)
