

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2022**

**EMBEDDED SYSTEM**

[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 any two features of ATmega family.
2. Write any two logic instruction used in ATmega32.
3. What is the size of RAM and ROM used in ATmega32?
4. Write the bit wise shift operators in AVR C.
5. Define inter task communication

(5 x 2 = 10)

**PART-B**

[Maximum Marks: 30]

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

1. Compare SRAM and EEPROM in ATmega32.
2. Explain call instruction used in Atmega 32.
3. Write an ALP to find number of ones in a given byte.
4. Draw the diagram of ATmega32 connection to RS232.
5. Explain about serial peripheral interface.
6. List the different categories of embedded OS and give example for each.
7. List the features of Embedded system.

(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) Draw the block diagram of AVR microcontroller and explain. (10)

(b) With the help of diagram explain ATmega32 status register. (5)

**OR**

- IV. (a) Explain the different addressing modes of ATmega32. (8)  
(b) Explain the data memory of ATmega32 microcontroller. (7)

**UNIT – II**

- V. (a) Explain rotate and shift instructions. (10)  
(b) Write an ALP to add two 16 bit data. (5)

**OR**

- VI. (a) Compare macros and subroutine. (5)  
(b) Explain data transfer instruction and arithmetic instruction of ATmega32. (10)

**UNIT- III**

- VII. (a) Describe the different data types used in AVR C. (7)  
(b) Draw the block diagram of Timer0 and explain. (8)

**OR**

- VIII. (a) Write the steps in executing the interrupt. (5)  
(b) Write an AVR C program to convert the BCD number 0x57 to ASCII. (10)

**UNIT - IV**

- IX. (a) With block diagram explain the architecture of an embedded system. (10)  
(b) Define task scheduling and mutual exclusion. (5)

**OR**

- X. (a) List the application area of embedded system. (5)  
(b) Explain the general architecture of an embedded operating system. (10)

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