

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, APRIL – 2024**

EMBEDDED SYSTEM

[Maximum Marks : 100]

[Time : 3 hours]

PART – A
(Maximum Marks : 10)

Marks

I. Answer **all** questions in one or two sentences. Each question carries 2 marks.

1. List two features of mega AVR.
2. Illustrate ROR instruction.
3. Mention about unsigned char data type in embedded C.
4. Define an Embedded system.
5. Narrate the speciality of hard real time embedded system.

(5x2=10)

PART – B
(Maximum Marks : 30)

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

1. Briefly describe the features of GPRs in ATmega32.
2. Give a description of I/O memory in ATmega32.
3. Describe how instruction pipeline is implemented in AVR.
4. Write an assembly language program to add two 16 bit numbers and save the result in R24 and R25.
5. Mention the various ways in which time delays are generated in Embedded C.
6. List any 6 application areas of embedded system.
7. Mention the various categories of embedded systems with examples.

(5x6=30)

PART – C

(Maximum Marks : 60)

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

UNIT – I

- III.** (a) Describe the status register in AVR. (6)
(b) Explain the general block diagram of ATmega32 microcontroller. (9)

OR

- IV.** (a) Explain the various addressing modes of AVR. (11)
(b) Compare the features of SRAM and EEPROM in ATmega32 microcontroller. (4)

UNIT – II

- V.** (a) Explain the operation of stack and stack pointers. (9)
(b) Write an assembly language program to multiply 0x07 and 0x05 which are stored in R20 and R21. Show the values stored in various registers. (6)

OR

- VI.** (a) Describe the various arithmetic instructions with examples in AVR assembly language. (10)
(b) Differentiate between JMP and IJMP instructions. (5)

UNIT –III

- VII.** (a) Mention the peculiarities of various data types used in embedded C. (9)
(b) Briefly describe (i) I/O programming in embedded C (3)
(ii) Logic operations in embedded C (3)

OR

- VIII.** (a) Describe the operation of I²C with diagrams. (7)
(b) Describe the connection of ATmega32 with RS232. (8)

UNIT – IV

- IX.** (a) Explain the general block diagram of embedded system. (8)
(b) List the specialities of embedded systems. (7)

OR

- X.** (a) Explain the general block diagram of embedded operating system. (7)
(b) Give an account of (i) Task (ii) Task Scheduling
(ii) Intertask communication (iv) Context switching

(2x4=8)
