

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

EMBEDDED SYSTEMS AND REAL TIME OPERATING SYSTEM

[Maximum Marks : 75]

[Time : 3 hours]

PART–A

I. Answer **all** the following questions in one word or sentence. Each question carries 1 mark.

(9x1=9 marks)

		Module Outcome	Cognitive level
1	Write the role of sensors.	M1.02	R
2	List the I/O ports in ATmega 32 microcontroller.	M1.03	R
3	Write the AVR C statement to set port C as input port.	M2.02	U
4	List the basic registers of AVR Timers.	M2.05	R
5	Define Interrupt Service Routine.	M2.07	R
6	Name the serial interface standard used in serial communication.	M3.01	R
7	Write the role of RS pin of LCD.	M3.01	R
8	Write the function of Task Control Block.	M4.03	R
9	Define Thread.	M4.03	R

PART B

II. Answer **any Eight** questions from the following. Each question carries 3 marks.

(8x3=24 marks)

		Module Outcome	Cognitive level
1	Compare microprocessor and microcontroller.	M1.02	U
2	Explain the AVR status register.	M1.03	U
3	Explain the registers associated with I/O operation in AVR.	M2.02	U
4	Write an AVR C program to display 0x00 to 0xFF through PORTB.	M2.03	A
5	Explain the source of interrupts.	M2.07	U
6	Write the steps in executing an interrupt.	M2.07	R
7	Draw the neat diagram for the interfacing of LCD.	M3.01	R
8	Write short note on DAC.	M3.02	R
9	Explain the structure of a process in operating system.	M4.03	U
10	Compare multiprocessing and multitasking.	M4.04	R

PART C

Answer **all** questions from the following. Each question carries 7 marks.

(6x7=42marks)

		Module Outcome	Cognitive level
III	Explain the architecture of embedded system. OR	M1.03	U
IV	Explain the following in ATmega32 (a) General Purpose Registers (b) Program counter (c) Data memory	M1.03	U
V	Explain the different logic and bitwise operators in AVR C with example. OR	M2.03	U
VI	Write an AVR C program to convert packed BCD number 0x47 to ASCII and display the bytes on PORT B and PORT C.	M2.04	A
VII	Explain different mode of operation in Timer programming. OR	M2.05	U
VIII	Explain the following (a) How to enable and disable interrupts in AVR? (b) Interrupt priority.	M2.05	U
IX	Explain the Interfacing of keyboard to AVR microcontroller. OR	M3.01	U
X	Illustrate the interfacing of RS232 with ATmega32 with the help of a block diagram.	M3.01	U
XI	Explain the functionalities of real-time operating system. OR	M4.02	U
XII	Describe the factors that affect the selection of a scheduling algorithm.	M4.05	R
XIII	Explain the following (a) Device Drivers (b) Task Communication (c) Task Synchronization OR	M4.07	R
XIV	Explain the requirements to choose an RTOS.	M4.08	U
