

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER - 2023**

EMBEDDED SYSTEM AND REAL TIME OPERATING SYSTEM

[Maximum Marks:75]

[Time: 3 Hours]

PART - A

I. Answer all the following questions in one word or one sentence. Each question carries 'one' marks.

(9 x 1 = 9 Marks)

Module Outcome Cognitive level

1	Define embedded system.	M1.01	R
2	Name the registers in ATmega 32 for input and output operations.	M1.03	R
3	Write AVR C statement to set PB2 pin of port B to function as output and rest of the pins as input.	M2.02	U
4	List any two bit wise operators in AVR C.	M2.03	R
5	Write the packed BCD representation of 14.	M2.04	U
6	Name the control pin used to select among registers in LCD.	M3.01	R
7	Define resolution in ADC.	M3.02	R
8	Write use of a Task Control Block.	M4.03	R
9	Define a process.	M4.03	R

PART - B

II. Answer any eight questions from the following. Each question carries 'Three' marks.

(8 x 3 = 24 Marks)

Module Outcome Cognitive level

1	Write short notes on program ROM memory of ATmega32.	M1.02	R
2	Compare embedded systems with general purpose computers.	M1.01	U
3	Write short notes on AVR status registers.	M1.03	R

4	Write an AVR C program to toggle all the pins of PORTA using inverter operator.	M2.03	A
5	Compare normal and CTC mode programming of AVR timers.	M2.05	U
6	Describe the ways to enable and disable interrupts in AVR.	M2.07	U
7	List out the advantages of choosing LCD for display in embedded systems.	M3.01	R
8	Write use of LM35 sensor. Draw the interfacing diagram of LM35 with ATmega32.	M3.02	R
9	Explain dead lock with an example.	M4.06	U
10	Differentiate multi processing and multi tasking.	M4.04	U

PART - C

Answer all questions from the following. Each question carries 'seven' marks.

(6 x 7 = 42 Marks)

Module Outcome Cognitive level

III.	Explain various applications of embedded systems. OR	M1.01	U
IV.	Explain the building blocks of an embedded system.	M1.02	U
V.	Write an AVR C program to rotate LEDs connected to PORTA of ATmega32 sequentially with a delay using shift operators. OR	M2.03	A
VI.	Write an AVR C program to convert packed BCD 0x34 to ASCII and display on PORTA and PORTB.	M2.04	A
VII.	Explain the steps to program Timer0 in normal mode. OR	M2.06	U
VIII.	Define Interrupt Service Routine. Discuss the different sources of interrupts in AVR.	M2.07	U
IX.	With a diagram, explain the interfacing of RS232 with ATmega32 chip. OR	M3.01	U
X.	Draw the connection diagram of 4x4 matrix keyboard with AVR and explain the steps to detect a key press.	M3.01	U
XI.	Describe the major functions of a real time operating system. OR	M4.01	U
XII.	What is task scheduling? Explain any task scheduling algorithm with example.	M4.05	U
XIII.	Explain the functional requirements in choosing a real time OS. OR	M4.08	U
XIV.	Describe the methods by which multiple tasks communicate each other in a multi tasking system.	M4.06	U
