

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

**EMBEDDED SYSTEMS**

[Maximum Marks: 75]

[Time: 3 Hours]

**PART-A**

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

**(9 x 1 = 9 Marks)**

		Module Outcome	Cognitive level
1.	List any two examples of embedded system.	M1.02	R
2.	..... is an example for sensor used in an embedded system.	M1.05	R
3.	What is the code memory size of ATmega32?	M2.02	R
4.	Name the 8-bit timers of ATMega32.	M2.04	R
5.	.....port of ATMega32 can be used as analog port.	M2.03	R
6.	A.....motor uses feedback to control motor's position and speed.	M3.05	R
7.	The resolution of ADC in ATMega32 is .....bit.	M3.06	R
8.	Name any two RTOS.	M4.05	R
9.	Define task in an embedded system.	M4.02	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.	List any 3 criteria for selection of microcontroller for an embedded system.	M2.01	R
2.	Classify embedded systems based on complexity and performance.	M1.02	U
3.	List software components of an embedded system.	M1.03	R
4.	List the data types in AVR C.	M2.05	R
5.	Draw the diagram of interfacing Relay with AVR.	M3.02	U
6.	Write an AVR C program to read an 8-bit data from Port B and display it on Port C.	M2.05	A
7.	Explain SPI interfacing.	M3.08	U
8.	Draw the diagram of interfacing 7-Segment display with ATMega32.	M3.03	U
9.	List any 3 categories of embedded operating systems.	M4.01	R
10.	List any three features of Macro C/OS-II.	M4.04	R

**PART-C**

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

**(6 x 7 = 42 Marks)**

		<small>Module Outcome</small>	<small>Cognitive level</small>
III.	List the difference between embedded system and general purpose computers (Any 7 points)	M1.01	R
	<b>OR</b>		
IV.	Explain architecture of an embedded system with a simple block diagram.	M1.04	U
V.	Draw the block diagram of AVR and explain.	M2.02	U
	<b>OR</b>		
VI.	Explain different types of memories used in an embedded system.	M1.05	U
VII.	Explain registers associated with ports and give simple (single line) examples showing how each is used in a program.	M2.03	U
	<b>OR</b>		
VIII.	Explain Interrupts of ATMega32.	M2.03	U
IX.	Draw the interfacing of opto coupler with ATMega32, and write the interfacing program.	M3.02	A
	<b>OR</b>		
X.	Develop an AVR C program to interface ADC with ATMega32.	M3.06	A
XI.	Explain interfacing of LCD with ATMega32 with suitable diagram.	M3.04	U
	<b>OR</b>		
XII.	Develop an AVR C program to interface DC motor with ATMega32.	M3.05	A
XIII.	List the selection criteria for an embedded OS.	M4.03	U
	<b>OR</b>		
XIV.	Explain RTOS kernel functions.	M4.02	U

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