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Reg. No……
Signature …….

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 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'* mark.

(9 x 1 = 9 Marks)

		Module Outcome	Cognitive level
1.	……..acts as an output device in embedded system applications.	M1.01	R
2.	Program ROM size of ATMega32 microcontroller is…….	M1.03	R
3.	List any two data types available in AVR C.	M2.01	R
4.	Write the AVR C statement to set port B to function as output.	M2.02	U
5.	List any one operational mode of AVR timer.	M2.05	R
6.	In reading the columns of a keyboard matrix, if no key is pressed we should get all values as……	M3.01	R
7.	Number of single ended inputs available in the ATMega32 ADC is …….	M3.02	R
8.	……is the core of an operating system.	M4.01	R
9.	Define thread.	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.	Explain about real time embedded systems. Also give its classification.	M1.01	U
2.	Write a short note on GPRs in ATMega32 microcontroller.	M1.03	U
3.	Explain the structure of program ROM memory of ATMega32.	M1.03	U
4.	Explain the functionalities of DDRx register in AVR.	M2.02	U
5.	Write an AVR C program to toggle port A with EX-OR operator.	M2.03	A
6.	Describe the normal mode operation of AVR Timerl.	M2.03	U
7.	Draw the block diagram of interfacing LM34 temperature sensor with ATMega32.	M3.02	U
8.	List any four features of ATMega32 ADC.	M3.02	R
9.	Explain the structure of a process in operating system.	M4.03	U
10.	Explain the role of device drivers in embedded operating systems.	M4.07	U

PART-C

Answer all questions. Each question carries *'seven'* marks

(6 x 7 = 42 Marks)

		Module Outcome	Cognitive level
III.	Compare embedded systems with general purpose computer.	M1.01	U
	OR		
IV.	Describe the basic block diagram of AVR microcontroller.	M1.03	U
V.	Write an AVR program to read data from PORT B, if it is less than 100 send it to PORT C; otherwise to PORT D.	M2.02	A
	OR		
VI.	Write an AVR C program to convert packed BCD number 0x29 to ASCII and display the bytes on PORT B and PORT C.	M2.03	A
VII.	Explain the steps for executing an Interrupt in AVR.	M2.07	U
	OR		
VIII.	Describe about the registers associated with AVR timer.	M2.05	U
IX.	Illustrate the interfacing of RS232 with ATMega32 with the help of a block diagram.	M3.01	U
	OR		
X.	Explain the steps to send data and commands from ATMega32 to LCD with the help of a block diagram.	M3.01	U
XI.	Explain the features of FCFS and SJF process scheduling algorithms.	M4.05	U
	OR		
XII.	Explain any four functionalities of real time operating system.	M4.01	U
XIII.	Define IPC. Explain shared memory mechanism for IPC.	M4.05	U
	OR		
XIV.	Explain the functional requirements for choosing RTOS.	M4.08	U

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