TED (21) 4041
(Revision-2021)

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

MICROCONTROLLER AND APPLICATIONS

[Maximum marks: 75] [Time: 3 Hours]

PART A

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

(9 x 1 = 9 Marks)

		Module outcome	Cognitive level
1	State the function of ALE in 8051 microcontrollers.	M1.03	R
2	Number of bits utilized for the address bus in the 8051 is …….	M1.02	R
3	Indicate the largest value that can be moved to register R1.	M2.02	U
4	Define stack.	M2.04	R
5	Describe the DJNZ instruction in 8051.	M2.02	U
6	List any two interrupt sources in 8051.	M3.01	R
7	Identify the timer mode that allows auto-reload operation.	M3.02	U
8	Define the function of the SCON register.	M3.04	R
9	…….. is the device used to achieve precise position control of rotating shafts in terms of steps.	M4.01	U

PART B

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

(8 x 3 = 24 Marks)

		Module outcome	Cognitive level
1	List out any six features of 8051.	M1.02	R
2	Discuss the function of port-3 pins of 8051.	M1.03	U
3	Discuss the process for selecting register banks in the 8051.	M1.04	U
4	Describe the process of subroutine execution in the 8051.	M2.03	U
5	Distinguish between the RR and RRC instructions.	M2.02	U
6	Outline the format of the TCON register.	M3.03	R
7	Describe the concept of baud rates in serial communication.	M3.04	U
8	Discuss the structure of the IE register.	M3.01	U
9	Explain the function of each bits in special function register PCON	M3.04	U
10	Summarize the need of interfacing in the context of microcontrollers.	M4.01	U

PART C
Answer all questions. Each question carries seven marks

(6 x 7 = 42 Marks)

		Module outcome	Cognitive level
III	Describe the pin configuration of 8051 microcontroller.	M1.03	R
	OR		
IV	Discuss the data memory organization of 8051 microcontroller.	M1.04	U
V	Summarize different addressing modes used in the 8051 microcontroller and provide a detailed explanation of one of them.	M2.02	U
	OR		
VI	Discuss on conditional branching in microcontrollers and explain the functionality of the following instructions: (i) JNZ LABEL (ii) DJNZ 42H, LABEL (iii) CJNE A, #45, LABEL	M2.02	U
VII	Illustrate the functionality of the CPL instruction in microcontrollers and write an assembly language program that utilizes the instruction to toggle the bits of port P2.	M2.04	A
	OR		
VIII	Write a program to divide the content of R0 by R1 and store the result in R2 and R3.	M2.04	A
IX	Discuss how the priority of interrupts is handled in the 8051.	M3.01	U
	OR		
X	Summarize the steps to program Timer in Mode-2 operation.	M3.02	U
XI	Outline the interfacing of DC motor with 8051.	M4.02	U
	OR		
XII	Discuss the procedure to interface an ADC with 8051.	M4.04	U
XIII	Discuss how a 4x4 keyboard is interfaced with 8051.	M4.04	U
	OR		
XIV	Describe the steps involved in interfacing a 16x2 LCD with 8051 with the help of necessary diagram.	M4.03	U

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