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R. V. COLLEGE OF ENGINEERING

Autonomous Institution affiliated to VTU

V Semester B. E. Examinations August 2022

Computer Science and Engineering

MICROPROCESSOR & MICROCONTROLLER

Time: 03 Hours ***Maximum Marks: 100***

Instructions to candidates:

1. Answer all questions from Part A. Part A questions should be answered in the first three pages of the answer book only.
2. Answer FIVE full questions from Part B.

PART A

1	1.1	Draw the flag register format structure of 8086 microprocessor.	02
	1.2	Write the Signal name, which is used / decides whether the processor is to operate in single processor or multiprocessor mode.	01
	1.3	Give an example for immediate addressing mode of 8086.	01
	1.4	Write the functionality of $\underline{XCHG\ BX}$ instruction.	01
	1.5	What is the contents of AL after executing the following instructions when $AL = 53$ and $CL = 29$. $ADD\ AL, CL$ DAA	02
	1.6	Identify the assembler directive, which is used the assembler to reserve $4\ words$ / $8\ bytes$ of memory for the specified variable.	01
	1.7	Distinguish between Jump and loop instructions.	02
	1.8	Draw the control word register format of 8255.	02
	1.9	Write any one difference between I/O mapped and memory-mapped.	01
	1.10	Write any two advantages of microcontroller.	02
	1.11	_____ is a device used to obtain an accurate position control of rotating shafts.	01
	1.12	Develop a stepper motor ALP to rotate five clockwise counts.	02
	1.13	Write any two salient features of ARM microcontrollers.	02

PART B

2	a	Draw the architecture of 8086. Also explain briefly the overall functionality of different units used in it.	10
	b	Explain briefly the physical memory organization of 8086.	06
		OR	
3	a	Write the functionality of the following signals: i) INTR ii) NMI iii) ALE	06
	b	With the help of a Read cycle timing diagram, explain the minimum mode operation of 8086 processor.	10

4	a	What are the different addressing modes of 8086? Explain each of them with suitable examples.	10
	b	Mention any three assembler directives used in 8086 ALP. Also explain them in brief with suitable examples.	06
		OR	
5	a	Using suitable examples, discuss any five instruction set of 8086.	10
	b	Develop an ALP program to add the contents of the memory location $2000H:0500H$ to contents of $3000H:0600H$ and store the result in $6000H:0800H$.	06
6	a	Draw the memory bank stack structure of 8086. Also describe how push and pop operations/instructions are used to insert and delete an element from the stack.	06
	b	What is an Interrupt? Write the structure of Interrupt vector table. Also explain any four interrupt types in detail.	10
		OR	
7	a	What are the differences between a Macro and a Subroutine?	06
	b	Draw the 8255 Internal architecture and explain each block functionality in detail.	10
8	a	Write the functional descriptions of the following with respect to the internal architecture of 8051. i) Accumulator ii) Stack pointer iii) Data pointer iv) Time registers	10
	b	Write a brief note on Register set of 8051.	06
		OR	
9	a	Using the format structure, explain the following operational features of 8051. i) PSW ii) TMOD	10
	b	Write a brief note on memory organization of 8051.	06
10	a	Using a neat diagram, discuss DAC interfacing with 8051. Also write a program to generate the Sawtooth waveform.	10
	b	Draw the keyboard interfacing & its functionality in detail.	06
		OR	
11	a	Draw and explain the working of stepper motor interfacing with 8051 controller.	10
	b	Write a program to move the stepper motor for N steps. Also write step angle calculations in detail.	06