Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: EC305

Course Name: MICROPROCESSOR & MICROCONTROLLERS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. Marks

1 a) Draw the architectural diagram of 8085 microprocessor and explain (10)

b) Explain the comparative features of memory mapped I/O and I/O mapped I/O interfacings to 8085 microprocessor along with its proper control signals required. (5)

2 a) Draw and explain the timing diagram of MVI B, data. If the clock frequency is 6 MHz, how much time is required for the execution of this instruction? (10)

b) Explain the purpose of the following signals in 8085 (i) READY (ii) AD0-AD7 (iii)HOLD (iv) IO/ M (v) INTR (5)

3 a) Give the advantage of using 8279 for keyboard/display interface? What are scan lines used for? Explain (i) Encoded Scan Mode and (ii) Decoded scan mode (10)

b) Draw and explain the schematic of latching low-order address bus in 8085 microprocessor. (5)

PART B

Answer any two full questions, each carries 15 marks.

4 a) An array of 10 numbers is stored in the internal data RAM starting from location 30 H. Write an assembly language program to sort the array in ascending order starting from location 40 H. (10)

b) What are different segments of memory with which 8086 can work? List the advantages of segmented memory. How is physical address determined from an offset address? (5)

5 a) Explain the following instructions: (5)

MOV A, @R1

MOVC A, @A+DPTR

MOVX A, @DPTR

DJNZ R0, BACK

DAA

b) Draw the memory map and briefly explain the memory organization for 128 byte internal RAM of 8051 microcontroller. (10)

6 a) Explain the functions of ports in 8051 microcontroller. How can P1 be used as both output and input port? (10)

b) List the addressing modes of 8051 with proper examples. (5)

PART C

Answer any two full questions, each carries 20 marks.

7 a) Explain, with necessary diagrams, how a 4-winding stepper motor can be interfaced and rotated in steps. Assume norma14-step sequence data as 09H, OCH, 06H and 03H respectively. (10)

b) Draw and explain the formats of TMOD, TCON, SCON, IE and IP registers of 8051 microcontroller. (10)

8 a) Write an assembly language program using 8051 microcontroller instructions to generate a square wave at port 1, pin 0. The frequency of the generated square wave is to be 1 kHz. (10)

b) Draw and explain interfacing diagram of DAC with 8051 microcontroller. Write program to generate square wave of 40 % duty cycle at the output of DAC. (10)

9 a) Write program to transfer the message “KTU” serially at 4800 baud rate, 8-bit data, 1 stop bit. (10)

b) Explain the interfacing of 8 bit ADC using 8051 microcontroller. (10)

****

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: EC305

Course Name: MICROPROCESSOR & MICROCONTROLLER

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

1 a) List the functional blocks of a microprocessor. Explain each block. (7)

b) Illustrate a typical microprocessor based system. Explain each block. (8)

2 a) What are the main features of fourth generation microprocessors? Give any three examples. (7)

b) Define the function of the following signals of 8085 microprocessor. (8)

i) IO/$\overline{M}$

ii) ALE

iii) $\overline{\text{RESET IN}}$

iv) SID

3 a) What are the different addressing modes used in 8085? Explain the instruction STAX rp. What is the addressing mode used in this instruction? (7)

b) List the different modes of operation of 8255 PPI. (8)

PART B

Answer any two full questions, each carries 15 marks.

4 a) List the flags used in 8086 microprocessor and explain their functions. (8)

b) What is a segment register? List the segment registers in 8086. (7)

5 a) Broadly classify instruction set of 8051. Give 2 examples for each class. (10)

b) Compare programmed input output data transfer with interrupt driven input output data transfer. (5)

6 a) List the special function registers in 8051 microcontroller. (8)

b) Compare a microcontroller with a microprocessor in terms of architectural features. (7)

PART C

Answer any two full questions, each carries 20 marks.

7	a)	What is an interrupt? What are the types of interrupts in 8051? Explain interrupt structure of 8051.	(10)
	b)	What function is performed by Interrupt Enable (IE) register and Interrupt Priority (IP) register in 8051?	(5)
	c)	How will you blink an LED using timer interrupt?	(5)
8	a)	How will you generate a 1 ms delay using 8051?	(5)
	b)	How a triangular waveform can be generated using 8051?	(10)
	c)	What is a stepper motor? How will you interface 8051 to a stepper motor?	(5)
9	a)	What are the advantages of serial data communication? What are its drawbacks?	(5)
	b)	How will you use 8051 for serial data communication?.	(5)
	c)	How will you read an analog voltage and display it on LCD using 8051?	(10)

****

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019

Course Code: EC305

Course Name: MICROPROCESSOR AND MICROCONTROLLERS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

			Marks
1	a)	Define machine cycle and instruction cycle	(5)
	b)	Draw and Explain 8085 Architecture	(10)
2	a)	Illustrate with relevant timing diagram, the sequence of operations involved in 8085 for fetching and Executing the instruction MVI A, 08H from external memory location 2005H and 2006H (Assume that Opcode for MVI A is DE)	(10)
	b)	Draw the bit pattern for 8085 flag register	(5)
3	a)	Bring out the significance of control and status signals with reference to various operations of 8085 microprocessor	(7.5)
	b)	Explain the addressing modes of 8085 with examples	(7.5)

PART B

Answer any two full questions, each carries 15 marks.

4	a)	Draw and Explain 8051 Architecture	(10)
	b)	Draw the bit pattern for 8051 flag register (PSW)	(5)
5	a)	Explain the addressing modes of 8051 with examples	(7.5)
	b)	Write an 8051 assembly language program to add two 32 bit numbers	(7.5)
6	a)	Draw and Explain the memory organization of 8051	(7.5)
	b)	Explain the classification of 8051 instruction set with examples	(7.5)

PART C

Answer any two full questions, each carries 20 marks.

7	a)	Explain TMOD SFR (Special Function Register)	(5)
	b)	Explain TCON SFR (Special Function Register)	(5)
	c)	Write an assembly language program in 8051 to toggle bit P1.5 continuously every 50ms. Use timer 0, Mode 1 to create the delay. (assume that XTAL = 12 MHZ)	(10)
8	a)	What is the difference between edge triggered and level triggered interrupts	(5)

b) Explain difference in counter and timer operation (5)

c) Draw a block diagram to interface stepper motor with 8051 with a step angle of 2 degree. Also write an assembly language program to rotate a motor 64 degree in clock wise direction. Use 4 step sequence (10)

9 a) What is an interrupt? List the interrupt sources of 8051 (5)

b) Draw the schematic to connect an LED to the P1.0 and develop an assembly language program to blink the LED continuously (5)

c) Write an 8051-assembly language program to generate two square waves one of 5 KHz frequency at P1.3, and another of frequency 25 KHz at pin P2.3. Assume XTAL=22 MHz (10)

****

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth semester B.Tech degree examinations (S) September 2020

Course Code: EC305

Course Name: MICROPROCESSOR & MICROCONTROLLER

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

			Marks
1	a)	Draw the architecture of 8085 and describe the functions of blocks.	(7)
	b)	Describe the method of separating the lower order address and data lines from AD0-AD7 of 8085 with block schematic and timing diagrams.	(8)
2	a)	List and explain the addressing modes of 8085 with 2 instructions in each mode with syntax and purpose of instruction as examples.	(10)
	b)	Draw the structure and describe the significance of each bit in the flag register of 8085.	(5)
3	a)	Draw the functional block diagram of 8255 and explain the preferable mode (any one) of operation with control word register for interfacing 8 LEDs in port A pins.	(8)
	b)	Describe the functions of S0, S1 and IO/M signals related to the various operations of 8085.	(7)

PART B

Answer any two full questions, each carries 15 marks.

4	a)	Illustrate the important functional units of 8086.	(5)
	b)	Draw the memory map of 8051. Explain the internal RAM organization and functions of SFRs related to Timer.	(10)
5	a)	Classify the instructions of 8051 according to their functions and write at least 2 instructions with description in each group as examples.	(8)
	b)	Write an ALP to add two 8 bit numbers which are stored in the memory locations 4500 & 4501H. Result (carry, sum) should be stored in the locations 4502 & 4503H respectively.	(7)
6	a)	Differentiate between Microprocessors and Microcontrollers.	(4)
	b)	List the pin/signals of 8051 and describe the functions of any 8 important signals.	(4)

c) Write an ALP to find the largest among N (count) 8 bit numbers which are stored in the memory location starting from 4201H. Result should be loaded in the location 4300H and assume that the count is available in the memory location 4200H. (7)

PART C

Answer any two full questions, each carries 20 marks.

7 a) List and describe the modes of operation of timers in 8051. (6)

b) Describe the interrupt structure of 8051 with IE register and explain how the interrupts are prioritized in 8051. (7)

c) List and describe the steps involved in the transmission and reception of data serially in 8051 using UART with relevant register details. (7)

8 a) Describe the interfacing of a stepper motor to 8051 with required diagrams and ALP to rotate the motor continuously in the clock-wise direction. Assume the required parameters and justify them. (10)

b) Describe the interfacing of an 8 bit DAC to 8051 with required diagram and ALP for generating a stair-case waveform with 2 steps and equal time duration in each step. Justify the voltage levels and time period with relevant calculations/descriptions. (10)

9 a) Draw the structure and discuss the significance of each bit in SCON register. (5)

b) For a crystal frequency of 12MHz, find the value to be loaded into TH register for the Baud rates of 9600 and 150. (5)

c) Describe the interfacing of 8 DIP switches and 8 LEDs which are connected to Port 1 and Port 2 of 8051 respectively for reading and displaying the digital information with relevant diagrams and ALP. (10)

****