Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree Regular and Supplementary Examination December 2020

Course Code: EC305
Course Name: MICROPROCESSORS & MICROCONTROLLERS

Max. Marks: 100   Duration: 3 Hours

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

1   a)   What are T states, machine cycles and instruction cycles in 8085?   (5)

    b)   Different control and status signals are there in 8085. Which are they? Explain each.   (5)

    c)   What are the functions of the following instructions in an 8085 assembly language program?   (5)

       i) DAA A   ii) XRA A   iii) LDAX R_p iv) RLC   v) EI

2   a)   With a neat diagram, explain the architecture of 8085.   (10)

    b)   Which IC can be used as an interface for 8085 if data is to be transmitted and received serially? Explain the transmitter and receiver section of that interface.   (5)

3   a)   What are the operations performed by 8085 while executing the instruction OUT 01H? Explain with a neat timing diagram. What is the time taken to execute this instruction if the frequency of clock connected with 8085 is 2MHz?   (8)

    b)   Draw and explain 8085 programming model and hardware model. What is the difference between the two?   (7)

PART B
Answer any two full questions, each carries 15 marks.

4   a)   Why 8086 architecture has different segments? Explain each segment in 8086 and show how physical address is generated in each.   (10)

    b)   Explain power down and idle mode in 8051. How can they be enabled and disabled.   (5)

5   a)   Explain register relative addressing mode and relative based indexed mode in 8086 with at least two examples.   (5)

b) Write an Assembly language program to add all numbers in RAM locations (10)
starting from 30 H to 40 H. Store the result in locations 70H and 71 H (sum
and carry). Write comments for each line of code.

6 a) Compare microprocessors and microcontrollers with respect to hardware (7.5)
architecture, applications and instruction set.

b) List at least 10 special function registers of 8051. Explain the function of each (7.5)
with a single sentence.

PART C
Answer any two full questions, each carries 20 marks.

7 a) What is the use of GATE bit in TMOD register? Explain with neat diagram. (5)

b) What is the importance of RI and TI flag in serial communication? (5)

c) How can a stepper motor be interfaced to 8051? Explain with neat diagram. (10)
Write an assembly language program to rotate the motor 32^0 in clockwise
direction. The motor has a step angle of 2^0 and use 4 step sequence.

8 a) Explain the two external hardware interrupts of 8051. (8)

b) Write an assembly language program to blink an LED connected to Port 1.5. (6)

c) How can an external frequency be counted using 8051? (6)

9 a) Write an assembly language program to send the word (10)
"MICROCONTROLLER" serially at 9600 baud rate. Assume the crystal
frequency as 11.0592 MHz, 8 bit data with 1 stop bit and use timer 1 to generate
the baud frequency.

b) What are seven segment displays? How can they be interfaced to 8051? Explain (10)
with the help of block diagram. Write the program to display the numbers from 0
to 9 in order.

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