

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) $IO/\bar{M}$   |     |
|   | ii) ALE   |     |
|   | iii) $\overline{\text{RESET IN}}$   |     |
|   | iv) $\text{SID}$  |     |
| 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)

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**SCMS**  
School of Engineering & Technology

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**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 interfacing 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 normal 14-step sequence data as 09H, 0CH, 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)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017**  
**Course Code: EC305**

**Course Name: MICROPROCESSOR & MICROCONTROLLERS (EC)**

Max. Marks: 100

Duration: 3 Hours

**PART A**

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

- |  | Marks |
|--|-------|
| 1 a) Draw and explain the 8085 architecture.                                       | (10)  |
| b) Define Machine Cycle and Instruction Cycle.                                     | (5)   |
| 2 a) Draw the bit pattern of 8085 flag register.                                   | (5)   |
| b) Explain the block diagram and operation of the 8279 Keyboard/Display interface. | (10)  |
| 3 a) Compare Mode 0, Mode 1 and Mode 2 operations of 8255.                         | (7)   |
| b) Explain the addressing modes of 8085 with example.                              | (8)   |

**PART B**

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

- |  |      |
|--|------|
| 4 a) What is the function of 8086 instruction queue.   | (4)  |
| b) What is the Difference between a Microprocessor and a Microcontroller?  | (4)  |
| c) Write an Assembly Language Program for 8051 to clear the lower 128 bytes of internal RAM with help of DJNZ instruction.   | (7)  |
| 5 a) With an example illustrate the physical address generation in 8086.   | (5)  |
| b) With the help of a functional block diagram explain the 8051 microcontroller.   | (10) |
| 6 a) Compare the 8086 and 80386 processors.  | (4)  |
| b) Explain the PSW special function register of 8051.  | (4)  |
| c) Fifteen bytes of data are stored from location 6CH of internal RAM of 8051. Write an ALP to count the number of locations which contain data 11H and to store the result to RAM location 6BH. | (7)  |

**PART C**

*Answer any two full questions, each carries 20 marks.*

- |  |      |
|--|------|
| 7 a) What is an interrupt? List the interrupt sources of 8051.   | (5)  |
| b) Explain the SFRs TMOD and TCON.   | (5)  |
| c) Draw a block diagram to interface a stepper motor to 8051 with a step angle of 1.8 degrees. Also write an ALP to run the motor alternatively in Slow and High speeds in clock wise direction. | (10) |
| 8 a) What is the difference between a Timer and Counter?   | (5)  |
| b) Write notes on serial communication of 8051.  | (5)  |
| c) Draw the schematic of DAC interface to 8051. Develop an ALP to generate square waves of 2 KHz frequency with 50 percent duty cycle using a DAC.   | (10) |
| 9 a) What is meant by vectored interrupts?   | (4)  |
| b) An 8051 microcontroller is interfaced with 12 MHz crystal. Develop an ALP to generate a delay of 2 seconds.   | (8)  |
| c) Draw the schematic to connect an LED to the P1.0 and develop a program to blink the LED continuously.   | (8)  |

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