Hall Ticket No | | | | | | | | | | | Question Paper Code: AECC19

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal-500043, Hyderabad

B.Tech V SEMESTER END EXAMINATIONS (REGULAR/ SUPPLEMENTARY) - FEBRUARY 2024
Regulation: UG20

MICROPROCESSORS AND MICROCONTROLLERS

Time: 3 Hours **(COMMON TO ECE | EEE)** **Max Marks: 70**

Answer ALL questions in Module I and II
Answer ONE out of two questions in Modules III, IV and V
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

MODULE – I

1. (a) Explain the internal hardware architecture of 8086 microprocessor with a neat block diagram. [BL: Understand| CO: 1|Marks: 7]

   (b) The register contents of 8086 are given below. AX=0000H, ES=7000H, SI=1000H, CX=8000H, SP=0002H SS=1234H, DS=5678H, BP=5634H and BX=ABCDH. Calculate the effective address and physical address of the flowing instructions.

   i) ADD AX,ES : [SI]
   ii) PUSH CX
   iii) MOV AX,[BP+BX-24D] [BL: Apply| CO: 1|Marks: 7]

MODULE – II

2. (a) Draw the internal architecture of USART 8251 and explain the significance of status and control register formats. [BL: Understand| CO: 2|Marks: 7]

   (b) Model interfacing of two 8K X 8 EPROMS and two 8K X 8 RAM chips with 8086 microprocessor with suitable address mapping. [BL: Apply| CO: 2|Marks: 7]

MODULE – III

3. (a) Demonstrate with a neat diagram the pin configuration of 8051 and the functionality of RST, $\overline{EA}$, $\overline{PSEN}$, ALE. [BL: Understand| CO: 3|Marks: 7]

   (b) Write an assembly language program based on 8051 microcontroller instruction set to perform four arithmetic operations on two 8 bit data [BL: Apply| CO: 3|Marks: 7]

4. (a) Illustrate the following data exchange instructions XCH A, Rn, XCH A, direct, XCH A, Ri, XCHD A, Ri. Differentiate SJMP, AJMP, LJMP instructions of 8051. [BL: Understand| CO: 4|Marks: 7]

   (b) Write an 8051 ALP to create a square wave of 1KHz with 50% duty cycle on bit 3 of port 1. [BL: Apply| CO: 4|Marks: 7]

MODULE – IV

5. (a) Discuss about the various SFR's related to interrupts in 8051, and state the interrupt priority. [BL: Understand| CO: 5|Marks: 7]

   (b) Write a program for counter 1 in mode 2 to count the pulse and display the state of TL1 count on port 2. Assume the clock input is connected to T1 pin. [BL: Apply| CO: 5|Marks: 7]. 50

6. (a) Describe the different modes of operation of timers/counters in 8051 with its associated register [BL: Understand| CO: 5|Marks: 7]

   (b) Write a program to rotate a stepper motor, as interfaced by 64^o in clockwise direction. Assume the motor has a step angle of 2^o. Use the 4 - step sequence. [BL: Apply| CO: 5|Marks: 7]

MODULE – V

7. (a) Demonstrate the architecture of ARM processor with a neat sketch. List various registers in ARM processor [BL: Understand| CO: 6|Marks: 7]

   (b) Elaborate the ARM single-register and multiple-register load-store addressing modes with example. [BL: Apply| CO: 6|Marks: 7]

8. (a) List various modes of ARM processor. Draw and explain the interrupt vector table of ARM processor in detail. [BL: Understand| CO: 6|Marks: 7]

   (b) Summarize the different thumb programming model of ARM controller with examples. [BL: Apply| CO: 6|Marks: 7]

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