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Question Paper Code:AECC19



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

(Dundigal-500043, Hyderabad)

B.Tech V SEMESTER END EXAMINATIONS (REGULAR) - DECEMBER 2022

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

- (a) Write the features of 8086 microprocessor. Describe the architecture of 8086 microprocessor with the help of block diagram. [BL: Understand| CO: 1|Marks: 7]

(b) What happens to the status flags as the sequence of the following instructions that are executed in 8086 microprocessor architecture? Assume that flags ZF, SF, CF, AF, OF and PF are initially reset.

```
MOV AX, 1234H
MOV BX, 0ABCDH
CMP AX, BX
```

[BL: Apply| CO: 1|Marks: 7]

MODULE – II

- (a) Illustrate the different operational modes of 8255 programmable peripheral interface? Explain types of input/output mode in brief. [BL: Understand| CO: 2|Marks: 7]

(b) Draw the schematic and write an assembly language program to interface ADC 0808 with 8086 using 8255 ports. Use Port A of 8255 for transferring digital data output of ADC to the CPU & Port C for control signals. Assume that an analog input is present at I/P2 of the ADC and a clock input of suitable frequency is available for ADC. [BL: Apply| CO: 2|Marks: 7]

MODULE – III

- (a) Discuss data read and data write operation of I/O port in 8051 microcontroller with a neat diagram. [BL: Understand| CO: 3|Marks: 7]

(b) Write an assembly program to transfer 10 data bytes stored in the external data memory 2100h to 5700h. Include comments in the code. [BL: Apply| CO: 3|Marks: 7]
- (a) Classify various addressing modes and explain any five addressing modes of 8051 with example for each. [BL: Understand| CO: 4|Marks: 7]

(b) Write an 8051 assembly code to sort the 20 data bytes stored from 10H location onwards in ascending order. Include comments in the code. [BL: Apply| CO: 4|Marks: 7]

MODULE – IV

5. (a) With a neat functional block diagram, explain the internal structure of 8051 timer/counter. [BL: Understand] CO: 5|Marks: 7
- (b) Write a program for the 8051 to transfer the message “GOOD LUCK” serially at 9600 baud, 8 bit data, and 1 stop bit continuously. Show the calculation of value to be loaded for timer1 TH1 register. [BL: Apply] CO: 5|Marks: 7
6. (a) Show the interrupt priority register format of 8051. Give the bit description for TMOD and SCON register of 8051 microcontroller. [BL: Understand] CO: 5|Marks: 7
- (b) Build an 8051 assembly language program to display 8 bit down counter using LEDs with a delay of 0.142s between each count. Show the delay calculation in detail. Assume crystal frequency as 11.0592kHz. Draw the interfacing diagram. [BL: Apply] CO: 5|Marks: 7

MODULE – V

7. (a) Illustrate the neat architecture block diagram of ARM processor and explain in brief. [BL: Understand] CO: 6|Marks: 7
- (b) Consider any 32 bit data as an example for each to explain the working of ADC, RSB, RSC and ADD instructions of ARM. [BL: Apply] CO: 6|Marks: 7
8. (a) Sketch and explain the various pipelining mechanisms adopted in different versions of ARM processors. [BL: Understand] CO: 6|Marks: 7
- (b) What will be the content in the register R0 after the execution of each one of following instruction? Assume $R1 = 0 \times 12345678$ and $R2 = 0 \times 01020304$. [BL: Apply] CO: 6|Marks: 7
- i) MOV R0,R1,LSL #04
 - ii) ADD R0,R1,R2,LSR #03
 - iii) MVN R0,R1,LSL #02
 - iv) MUL R0,R1,R2