Code No: R2032041 **R20** SET -1

III B. Tech II Semester Regular/Supplementary Examinations, May/June -2023

MICRO PROCESSORS AND MICRO CONTROLLERS

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

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UNIT-I

1. a) Draw and explain the internal architecture of 8086 processor. [7M]
   b) Draw the flag register of 8086 microprocessor and explain the function of each flag with a suitable example. [7M]

(OR)

2. a) Draw a diagram showing the pins for 8086 microprocessor in the minimum mode and describe purpose of each pin. [7M]
   b) Explain different maskable and non maskable interrupts of 8086 microprocessor. [7M]

UNIT-II

3. a) Explain the data transfer instructions with suitable examples. [7M]
   b) Write an Assembly language program to find number of even and odd numbers in an 8- Bit array. [7M]

(OR)

4. a) Explain the programming development steps in 8086 microprocessor [7M]
   b) Write an assembly language program to generate Fibonacci series up to a given number. [7M]

UNIT-III

5. a) Draw and explain the Interface Eight 8K RAM chips and Four 8K×4 EPROM chips with 8086 so as to form a completely working system configuration. [7M]
   b) Explain the BSR mode of operation of 8255 programmable peripheral interface. [7M]

(OR)

6. a) Explain about the architecture of 8251 USART in detail. [7M]
   b) Write an assembly language program in 8086 to generate a symmetrical square wave with 1KHz frequency? Give the necessary circuit set up with a DAC. [7M]

UNIT-IV

7. a) Explain briefly the interrupts of 8051and indicate by their vector address. [7M]
   b) Write a Assembly program to multiply the unsigned number in register R3 by the unsigned number on port 2 and put the result in external RAM locations 10H (MSB) & 11H(LSB). [7M]

(OR)

8. a) Describe function PSEN, EA, XTAL1 & XTAL2 pins of 8051 microcontroller [7M]
   b) Explain the complete interfacing mechanism of a stepper motor with 8051 Microcontroller. [7M]

UNIT-V

9. a) Explain the Functional Description of ARM Cortex-M3 Processor. [7M]
   b) Explain nested interrupt handler with a neat sketch. [7M]

(OR)

10. a) Explain two stack model and reset sequence in ARM cortex M3. [7M]
    b) Describe the Supervisor and Pendable Service Call exceptions targeted at Software and operating systems. [7M]

Code No: R2032041 **R20** SET -2

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Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

UNIT-I

1. a) What are the different segment registers in 8086? What is the need for memory segmentation? [7M]
   b) Draw and explain the read and write cycle timing diagrams of 8086 in maximum mode. [7M]

(OR)

2. a) Describe the implementation of pipelined process of 8086. [7M]
   b) Compare the characteristics of CISC and RISC architectures. [7M]

UNIT-II

3. a) Explain the following instructions :i)HLT (ii)LOCK (iii)CLI (iv)XLAT (v) PUSH (vi) POP with suitable examples. [7M]
   b) Explain any six assembler directives used in 8086 microprocessor. [7M]

(OR)

4. a) Explain the 8086 steps involved in Program development. [7M]
   b) Write an Assembly language program to add two 16-bit Hexa decimal numbers in 8086. [7M]

UNIT-III

5. a) Draw the Block diagram of 8237 DMA controller and explain its operations. [7M]
   b) Draw and explain the synchronous mode transmitter and receiver data formats of 8251. [7M]

(OR)

6. a) What is the need for 8259 programmable interrupt controllers? Explain its functioning. [7M]
   b) Explain the interfacing procedure of an 8-bit ADC with 8086 microprocessor. [7M]

UNIT-IV

7. a) Explain briefly the interrupts of 8051and indicate by their vector address. [7M]
   b) Write an ALP to find the first two internal RAM locations between 20h and 60 h which contain consecutive numbers. If so, set the carry flag, else clear the flag. [7M]

(OR)

8. a) List and explain various addressing modes of 8051 microcontroller. [7M]
   b) Draw and explain interfacing of 4×4 matrix keyboard with 8051microcontroller. Write program to read switch. [7M]

UNIT-V

9. a) Describe the main features of the Cortex M3 processor core: architecture, instruction set, instruction execution, pipe-line, major internal core blocks, and operating modes. What's new comparing to the ARM7 core? [7M]
   b) Explain the following ARM Cortex M# instructions with examples [7M]
      i) RSB ii) ASR iii) BIC iv) BFI v) SBFX vi) REVSH

(OR)

10. a) Briefly explain about different data operations used in ARM processor. [7M]
    b) Describe the Supervisor and Pendable Service Call exceptions targeted at Software and operating systems [7M]

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Code No: R2032041 **R20** SET -3

III B. Tech II Semester Regular/Supplementary Examinations, May/June -2023

MICRO PROCESSORS AND MICRO CONTROLLERS

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

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UNIT-I

1. a) Explain significance of each bit of flag register of 8086 family microprocessor. [7M]
   b) Draw the interrupt vector table of 8086 microprocessor and explain its operation in detail. [7M]

(OR)

2. a) Draw the timing diagrams of minimum mode write operation and explain in detail. [7M]
   b) Compare the Harvard and Von Neumann architectures with suitable examples. [7M]

UNIT-II

3. a) Describe in detail about the Procedures with suitable syntax and example. [7M]
   b) Write an 8086 assembly language program to sort an array of data in descending order. [7M]

(OR)

4. a) Describe the assembler directives of 8086 microprocessor.(i) ASSUME (ii) EQU (iii) OFFSET with examples. [7M]
   b) Explain in detail about the Stack Structure of 8086. Write a sample program to illustrate the concept of programming the stack. [7M]

UNIT-III

5. a) Interface Eight 8K RAM chips and Four 8K×4 EPROM chips with 8086 so as to form a completely working system configuration. [7M]
   b) Discuss in detail the architecture of 8259. [7M]

(OR)

6. a) Draw the Block diagram of 8237 DMA controller and explain its operations. [7M]
   b) Draw the Interfacing diagram of D/A Converter with 8086 Microprocessor along with 8255 PPI and explain its operation. [7M]

UNIT-IV

7. a) Explain the following instructions of 8051 MC with example [7M]
      i) ACALL ii) MOVC iii) JBC iv) CJNE
   b) Write and explain the instructions to read the SBUF eight times with an interval of 0.33ms and save the results between the R0 and R7 of the register bank 0. [7M]
      How does the timer overflow interrupt differ from real time clocked interrupts? Discuss in detailed.

(OR)

8. a) Write an ALP to find the first two internal RAM locations between 20h and 60 h which contain consecutive numbers. If so, set the carry flag, else clear the flag. [7M]
   b) Discuss the internal memory organization of 8051 microcontroller. [7M]

UNIT-V

9. a) Describe in detail the modes of operation in ARM processor. [7M]
   b) Write about the program status register instructions in ARM processor. [7M]

(OR)

10. a) Describe the Software Interrupt instructions in ARM. [7M]
    b) Explain the functional description of a Nested Vectored Interrupt Controller and its programmers' model. [7M]

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UNIT-I

1. a) Draw the register organization of 8086 Microprocessor and explain their functions. [7M]
   b) Explain different maskable and non maskable interrupts of 8086 microprocessor. [7M]

(OR)

2. a) Discuss the various pins in minimum and maximum mode configurations of 8086. [7M]
   b) Explain the concept of memory segmentation and address calculation of 8086 microprocessor. [7M]

UNIT-II

3. a) Write an assembly language program to find the largest number of an array 8- bit array. [7M]
   b) List the string manipulation instruction set of 8086 microprocessor with examples. [7M]

(OR)

4. a) Explain the following instructions of 8086: i) AAM ii) DAS iii) LOCK iv) CALL. [7M]
   b) Write an assembly language program to multiply two-bit Hexa decimal numbers in 8086. [7M]

UNIT-III

5. a) Draw the interacting diagram of A/D convertor with 8086 microprocessor and explain its operation. [7M]
   b) Explain about the DMA data transfer method using 8237. [7M]

(OR)

6. a) With a neat block diagram, explain in detail the internal architecture of 8255 and its registers. [7M]
   b) Explain the procedure to interface stepper motor to 8086 processor. [7M]

UNIT-IV

7. a) Explain the functioning of PSW and TCON registers of 8051 microcontroller. [7M]
   b) Explain briefly the interrupts of 8051and indicate by their vector address. [7M]

(OR)

8. a) Explain in detail timer modes of operation with necessary registers in 8051. [7M]
   b) Write an assemble language program for LED blinking in 8051 microcontroller. [7M]

UNIT-V

9. a) Give the ARM Cortex-M3 Processor Functional Description. [7M]
   b) Explain the following instructions with example: [7M]
   i)SWP R0, R1 ii) MUL R1, R2, R3 iii) LDR R2, [R3] iv) UMULL R0, R1, R2, R3 v) ANDS R0, R1, R2 vi) BLNEXT

(OR)

10. a) Explain the internal architecture of ARM processor. [7M]
    b) What is NVIC? Explain its programmers' model. [7M]

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