

Code No: RT32041

R13

SET - 1

III B. Tech II Semester Regular Examinations, April - 2016
MICRO PROCESSORS AND MICRO CONTROLLERS

(Common to ECE, EIE and E.Comp.E)

Time: 3 hours

Maximum Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) Draw the flag register of 8086 microprocessor and explain the function of each flag. [4M]
- b) Define interrupt and explain the different interrupts presented in 8086 microprocessor. [4M]
- c) Explain the differences between synchronous and asynchronous serial communication. [4M]
- d) List out the salient features of 80386 processor. [3M]
- e) Explain the concept of addressing modes used in 8051 microcontroller [4M]
- f) List out the salient features of PIC 16C61 controller. [3M]

PART -B

- 2 a) Draw the minimum mode pin diagram and explain the function of each pin in detail. [8M]
- b) Explain any six assembler directives used in 8086 microprocessor. [4M]
- c) Draw the timing diagrams of minimum mode write operation and explain in detail. [4M]
- 3 a) Write an assembly language program to find the largest number of an array 8-bit array. [8M]
- b) Explain different maskable and non maskable interrupts of 8086 microprocessor. [8M]
- 4 a) Draw the internal architecture of 8259 PIC and explain the operation of each block in detail. [8M]
- b) Explain ICW's and OCW's of 8259 Priority interrupt controller. [8M]
- 5 a) Explain the Real mode and protected mode concepts of 80386 Microprocessor. [8M]
- b) Draw the EFLAG register of 80386 processor and explain the function of each flag with example. [8M]
- 6 a) Draw the pin diagram of 8051 microcontroller and explain the function of each pin in detail. [8M]
- b) Explain the differences between microprocessor and microcontroller. [8M]
- 7 a) Explain different I/O ports presented in PIC controller and draw the necessary diagram for it. [8M]
- b) Explain the feature of ARM controller in detail. [8M]

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3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) List different registers of 8086 microprocessor. [3M]
- b) Define interrupt and explain the different software interrupts presented in 8086 microprocessor. [4M]
- c) Explain the methods of serial communications with examples. [4M]
- d) List out the different data types of 80386 processor. [3M]
- e) Explain the different features of 8051 microcontroller. [4M]
- f) List out the salient features of PIC 16F8XX Flash controller. [4M]

PART -B

- 2 a) Draw the timing diagrams of minimum mode read operation and explain in detail. [4M]
- b) Define addressing mode and explain different addressing modes presented in 8086 microprocessor. [8M]
- c) Explain the data transfer instructions with examples. [4M]
- 3 a) Write an Assemble language program to find number of even and odd numbers in an 8- Bit array. [8M]
- b) Draw the interrupt vector table of 8086 microprocessor and explain its operation in detail. [8M]
- 4 a) Interfacing of a two 4X4 PROM and two 8X4 RAM with 8086 CPU, draw the memory map and interfacing diagram for it, the RAM address follows the ROM address. [8M]
- b) Draw the Inter facing diagram of 8257 DMA with 8086 CPU and explain its operation. [8M]
- 5 a) Draw the internal architecture of 80386 processor and explain its operation in detail. [8M]
- b) Explain the terms segmentation and paging of 80386 processor. [8M]
- 6 a) Draw the architecture of 8051 Microcontroller and explain its futures in detail. [8M]
- b) Explain the interrupt structure of 8051 Microcontroller. [8M]
- 7 a) Explain the different Thumb programming model of ARM controller with examples. [8M]
- b) Draw and Explain different timers presented in PIC controller. [8M]

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SET - 3

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2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) Explain the different minimum mode pins of 8086 microprocessor. [3M]
- b) Explain the concept of nested interrupts of 8086 microprocessor. [4M]
- c) Differentiate between BSR and I/O modes of 8255 PPI. [4M]
- d) List out the different addressing modes of 80386 processor. [3M]
- e) Explain the differences between microprocessor and microcontroller. [4M]
- f) List out the salient features of ARM controller. [4M]

PART -B

- 2 a) Define assembler and explain the different assembler directives used in 8086 microprocessor. [4M]
- b) Draw the 8086 microprocessor internal architecture and explain the operation of each block. [8M]
- c) Draw the flag register of 8086 microprocessor and explain the function of each flag. [4M]
- 3 a) Write an Assembly language program to print the given string "JNTU KAKINADA". [8M]
- b) Define interrupt and explain the interrupt service routines in 8086 microprocessor programming. [8M]
- 4 a) Draw the 8257 DMA architecture and explain its operation along with register organization of DMA. [8M]
- b) Draw the 8251 USART architecture and explain the operation of each block in it. [8M]
- 5 a) Draw and explain the virtual 8086 mode of 80386 processor in detail. [8M]
- b) Explain different data types used in 80386 processor. [8M]
- 6 a) Explain the timer and counter operations of 8051 Microcontroller. [8M]
- b) Write short notes on (i) PSW (ii) SCON (iii) PCON (iv) TMOD. [8M]
- 7 a) Draw the architecture of PIC 16C61 controller and explain the operation of each block in it. [8M]
- b) Draw the flag register of PIC 16C71 controller and explain the function of each flag in detail. [8M]

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PART -A

- 1 a) Explain the different maximum mode pins of 8086 microprocessor. [3M]
- b) Explain the concept of stack structure of 8086 microprocessor. [4M]
- c) Draw the ICW's of 8259 Programmable interrupt controller. [4M]
- d) Define paging and explain its importance in 80386 processor. [3M]
- e) Draw the PSW register of 8051 microcontroller and explain function of each pin. [4M]
- f) List out the interrupts of PIC 16C61 controller. [4M]

PART -B

- 2 a) Draw the minimum mode pin diagram of 8086 microprocessor and explain each pin in detail. [8M]
- b) Define addressing mode and explain different addressing modes presented in 8086 microprocessor. [8M]
- 3 a) Write an Assemble language program to find the sum of squares of first ten numbers. [8M]
- b) Draw the interrupt cycle of 8086 microprocessor and explain its operation in detail. [8M]
- 4 a) Draw the Interfacing diagram of D/A Converter with 8086 Microprocessor along with 8255 PPI and explain its operation. [8M]
- b) Draw the 8255 PPI architecture and explain its operation of each block along with modes of it. [8M]
- 5 a) Explain the different addressing modes of 80386 processor with examples. [8M]
- b) Explain the concept of protected mode of 80386 processor in detail. [8M]
- 6 a) Draw the 8051 Microcontroller architecture and explain its operation in detail. [8M]
- b) Explain the following registers (i) IP (ii) IE (iii) PCON (iv) TMOD. [8M]
- 7 a) Draw the architecture of ARM controller and explain the operation of each block in it. [8M]
- b) Explain the Power on reset and watch dog timers operation in PIC controller in detail. [8M]
