

Code No: RT32021

R13

SET - 1

**III B. Tech II Semester Regular Examinations, April – 2016**  
**MICROPROCESSORS AND MICROCONTROLLERS**  
(Electrical and Electronics Engineering)

Time: 3 hours

Maximum Marks: 70

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- 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**

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**PART -A**

- 1 a) Specify the size of data, address, memory word and memory capacity of 8086 microprocessor [3M]
- b) What do you mean by masking the interrupt? Explain [4M]
- c) How is PUSH B instruction executed? Find the status after execution [4M]
- d) Write the function of OBF in 8255? [3M]
- e) List the on-chip peripherals of 8051 microcontroller. [4M]
- f) What is the difference between A/D and D/A converters? [4M]

**PART -B**

- 2 a) Draw the flag register of 8086 microprocessor. [4M]
- b) Discuss how pipelined architecture is implemented in 8086 [8M]
- c) List classification of signals in 8086 microprocessor. [4M]
- 3 a) Give two examples for logical and branch instructions of 8086. [4M]
- b) Draw the timing diagram for op-code fetch machine cycle and memory read machine cycle. [7M]
- c) Write an assembly language program to multiply two 16 bit numbers. [5M]
- 4 a) Write instructions to load hexadecimal numbers 61B4H in register C and 8245H in accumulator. Display the number 61B4H in port0 and 8245H in port1. [8M]
- b) List various assembler directives of 8086 microprocessor. [8M]
- 5 a) Draw the logical block diagram of 8279 keyboard display controller and explain. [8M]
- b) How data is transmitted in asynchronous serial communication? [8M]
- 6 a) Draw the pin Diagram of 8051 and explain the function of various signals. [10M]
- b) Explain addition and subtraction instructions of 8051. [6M]
- 7 a) Interface an 8×8 keyboard using 8255 ports and write a program to read the code of pressed key [8M]
- b) Quantify the number of register banks in 8051 and say how CPU knows which bank is currently in use. [8M]

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**PART -A**

- |   |                                                                                   |      |
|---|-----------------------------------------------------------------------------------|------|
| 1 | a) How the identified memory segment is accessed by 8086 microprocessor?          | [3M] |
|   | b) Differentiate between maximum mode and minimum mode of 8086.                   | [4M] |
|   | c) List the alternative functions assigned to Port 3 pins of 8051 microcontroller | [4M] |
|   | d) Discuss basic features of 8259                                                 | [3M] |
|   | e) Mention the I/O instructions of 8051 microcontroller.                          | [4M] |
|   | f) What do you mean by quantization noise?                                        | [4M] |

**PART -B**

- |   |                                                                                                           |      |
|---|-----------------------------------------------------------------------------------------------------------|------|
| 2 | a) Discuss architecture of 8086 microprocessor.                                                           | [8M] |
|   | b) List basic features of 80286 microprocessor.                                                           | [4M] |
|   | c) List any two data manipulation instructions.                                                           | [4M] |
| 3 | a) Describe interrupt structure of 8086 microprocessor in brief.                                          | [3M] |
|   | b) Discuss about instruction format and different addressing modes of 8086.                               | [8M] |
|   | c) Draw and explain timing diagram of memory write operation.                                             | [5M] |
| 4 | a) What is an assembler directive? Explain following assembler directives.                                | [8M] |
|   | (i) ORG (ii) DT (iii) GROUP (iv) SEGMENT (v) EQU                                                          |      |
|   | b) Write an ALP in 8051 to count number of positive and negative numbers from an array of 8-bit integers. | [8M] |
| 5 | a) With neat block diagram explain the functions of 8259                                                  | [8M] |
|   | b) Discuss the process of stepper motor interfacing.                                                      | [8M] |
| 6 | a) List the various instructions available in 8051 microcontroller.                                       | [8M] |
|   | b) Explain in detail the modes of operation of Timer unit in 8051 Microcontroller.                        | [8M] |
| 7 | a) How to interface a 7 segment display using 8051 microcontroller                                        | [8M] |
|   | b) What do you understand by bit addressable RAM in 8051 microcontroller?                                 | [8M] |

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**PART -A**

- 1 a) If the stack segment register contains 3000h and stack pointer register contains 8434h, what is the physical address of the top of the stack in 8086 microprocessor? [3M]
- b) Define machine cycle [4M]
- c) Mention the size of DPTR and Stack Pointer in 8051 microcontroller [4M]
- d) Write advantages of PIC chips in microprocessor based systems. [3M]
- e) What are the addressing modes of 8051 microcontroller? [4M]
- f) Name any two types of A to D converters. [4M]

**PART -B**

- 2 a) List basic features of 80386 microprocessor. [4M]
- b) Draw the signal configuration of 8086 and explain the purpose of each signal. [8M]
- c) Discuss the similarities and differences between COMPARE and SUBTRACT instructions. [4M]
- 3 a) Draw the timing diagram of I/O read cycle. [3M]
- b) Discuss the addressing modes of 8086 with suitable examples. [8M]
- c) Describe with a suitable example, operation of a stack. [5M]
- 4 a) Compare macros and procedures with suitable examples. [8M]
- b) Give the assembly language implementation of the following: [8M]  
 (i) FOR LOOP (ii) REPEAT (iii) IF-THEN-ELSE
- 5 a) Draw block diagram of 8255 and explain its modes of operation. [8M]
- b) Discuss the features of 8259 and 8279. [8M]
- 6 a) Write an 8051 ALP to find Fibonacci series of N numbers. [8M]
- b) Explain various types of jump instructions in 8051. [8M]
- 7 a) How do you interface a 4 × 4 matrix keyboard using 8051 microcontroller? [8M]
- b) Explain different methods of memory address decoding in 8051 microcontroller. [8M]

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**PART -A**

- 1 a) Why do we need look-up table? [3M]  
b) Define instruction cycle [4M]  
c) What is the operation of given 8051 microcontroller instructions: XRL A, direct? [4M]  
d) What is key debouncing? [3M]  
e) What are the different operations performed by boolean variable instructions of 8051? [4M]  
f) How much current is needed to drive an LED? [4M]

**PART -B**

- 2 a) Discuss the features of 80486 microprocessor [4M]  
b) Discuss in-detail about instruction set of 8086 microprocessor. [8M]  
c) What is instruction pipelining? [4M]
- 3 a) Compare the similarities and differences of CALL and RET instructions with PUSH and POP instructions. [3M]  
b) Write a program with a flowchart to multiply two 8-bit numbers. [8M]  
c) How address decoding is done in memory interface? Discuss. [5M]
- 4 a) What is the difference between Microprocessors and Microcontrollers? [8M]  
b) What is a MACRO? How do you pass parameters to MACRO's? [8M]
- 5 a) Make a comparison between parallel and serial type of data transfer. [8M]  
b) Show the control word format of 8255 and explain how each bit is programmed? [8M]
- 6 a) Write an 8051 ALP to find the average of N numbers. [8M]  
b) Explain the Data transfer instructions and Program control instructions of 8051 microcontroller. [8M]
- 7 a) Explain the interfacing of keyboard/display with 8051 microcontroller. [8M]  
b) Why do we need opto-isolator circuit between microcontroller and the stepper motor? [8M]

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