

Code No: RT32021

**R13**

**SET - 1**

**III B. Tech II Semester Regular/Supplementary Examinations, April -2018**  
**MICROPROCESSORS AND MICROCONTROLLERS**  
(Electrical and Electronics Engineering)

Time: 3 hours

Max. 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**

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**PART -A**

- 1 a) Write the advantages of second generation microprocessor. [4M]
- b) Write a note on machine control and flag manipulation instructions of 8086. [4M]
- c) Write a note on the assemble directive END and EQU (equate). [4M]
- d) Write the salient features of 8259. [3M]
- e) List the salient features of 8051. [3M]
- f) Write a short note on matrix keyboard interface of 8051. [4M]

**PART -B**

- 2 a) Draw the pin diagram of 8086 microprocessor and explain the function of each pin. [8M]
- b) Explain Accumulator, Temporary registers and General purpose registers in 8086 microprocessor. [8M]
- 3 a) Explain any four types of addressing modes of 8086 microprocessor with examples. [8M]
- b) Explain the different logical instructions of 8086 microprocessor. [8M]
- 4 a) Differentiate Macro and Subroutine. [8M]
- b) Write an ALP in 8086 to find a maximum number in the array of 10 numbers. [8M]
- 5 a) Differentiate a system clock and peripheral clock and explain about the control block of 8255. [8M]
- b) Write an assembly language program for Controlling Stepper Motor. [8M]
- 6 a) Draw the block diagram of microcontroller and explain it. [8M]
- b) Discuss the register set of MCS-51 family of microcontrollers. [8M]
- 7 a) Explain the interfacing of external data memory to 8051 using 74LS573 latch with a neat diagram and draw the waveforms. [8M]
- b) Write an 8051 subroutine to control the 7-segment display operation. [8M]

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**PART -A**

- 1 a) Define bus? Discuss the A-bus, B-bus and C-bus and their use. [3M]
- b) Explain register relative addressing modes of 8086 microprocessor. [4M]
- c) Write a note on the assemble directive EXTRN and PUBLIC. [4M]
- d) Describe the Bit Set/Reset(BSR) mode of operation for 8255 using relevant diagram. [4M]
- e) Explain Mathematical Flags of 8051 microcontroller. [4M]
- f) Write a note on push button switch. [3M]

**PART -B**

- 2 Draw the architecture diagram and explain the functioning of an 8086 microprocessor. [16M]
- 3 a) Explain i)MOV ii)PUSH iii)POP iv)XCHG v)IN data transfer instructions of 8086 microprocessor with examples. [8M]
- b) Explain minimum mode operation of 8086 and draw its pin diagram. [8M]
- 4 a) Write the assembly language implementation of FOR loop with a suitable example. [8M]
- b) Write an ALP in 8086 to multiply a 16-bit unsigned number by an 8-bit unsigned number. [8M]
- 5 a) Define interfacing? Describe briefly about PPI chip. [8M]
- b) Draw the block diagram of 8259 and explain each block. [8M]
- 6 a) Explain the working of 8051 oscillator and clock. [8M]
- b) Explain the alternate functions of port 0, port2 and port3. [8M]
- 7 a) Interface an 8-bit,7-segment LED display to 8051 through port1 and port 3 and write an 8051 assembly language program to display message on the display. [8M]
- b) With a neat sketch explain the keyboard interfacing with 8051. [8M]

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

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**PART -A**

- 1 a) Discuss about multiplexing in 8086 microprocessor. [3M]
- b) Explain i)LEA ii)LDS/LES iii)LAHF data transfer instructions of 8086 microprocessor. [4M]
- c) Discuss in detail about 8051 instruction set. [4M]
- d) Write the advantages and disadvantages of SRAM and DRAM memories. [4M]
- e) Draw the data memory organization in 8051 microcontroller. [4M]
- f) Write a short note on relays. [3M]

**PART -B**

- 2 a) Which types of control signals are useful for interprocessor communication using 8086? What instruction set support is provided in 8086? [8M]
- b) List out segmentation register of 8086. Explain how 8086 provides 1MB memory address space using the segment register. What is the purpose of extra segment? [8M]
- 3 a) Explain the arithmetic instruction of the 8086 microprocessor. [8M]
- b) Explain the physical address formation in 8086. [8M]
- 4 a) Discuss about various addressing modes of 8051. [8M]
- b) Explain the format and bit definition of the following SFR`s in 8051  
i)TMOD ii) TCON iii)IP. [8M]
- 5 a) Explain how an ADC can be interfaced to microprocessor. Give the required instruction sequence to acquire one sample from ADC. [8M]
- b) Explain the applications of stepper motor in microcomputers. [8M]
- 6 a) Draw the pin diagram of 8051 and explain the functioning of each and every pin. [8M]
- b) Explain about memory and I/O addressing of 8051. [8M]
- 7 a) Write the application of electromagnetic relay and explain how a electromagnetic relay is connected to a 8051 microcontroller with diagram. [8M]
- b) Give the pin diagram of CD4511 7-segment display and explain how you can interface to 8051. [8M]

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**PART -A**

- 1 a) Write the uses of memory segmentation of 8086. [4M]
- b) Write the sequence operations of Conditional Jump in 8086 microprocessor. [4M]
- c) Draw and discuss the PCON format in 8051 microcontroller. [4M]
- d) Write the important features of 8237/8257. [4M]
- e) Draw the program memory organization in 8051 microcontroller. [3M]
- f) Write a short note on latches. [3M]

**PART -B**

- 2 a) Draw 16-bit flag register format of 8086 and explain each flag in detail. [8M]
- b) Discuss the system bus cycle of 8086 with a neat diagram and write the uses of wait cycles. [8M]
- 3 a) Write the loop instruction and their functions of 8086 and explain the use of DF flag in the execution of string instructions. [8M]
- b) Draw and discuss the minimum mode 8086 system with relevant read and write cycle timing. [8M]
- 4 a) Explain the arithmetic instruction of 8051 with examples. [8M]
- b) Explain programming of timer interrupts with an example. [8M]
- 5 a) Write an ALP in 8086 to generate a symmetrical square wave form with 1KHz frequency. Give the necessary circuit setup with a DAC. [8M]
- b) Differentiate static RAM and dynamic RAM with some examples. [8M]
- 6 a) Define polling? Explain interrupt structure of 8051. [8M]
- b) Explain with the suitable waveforms, for different modes of serial data transmission modes in 8051. [8M]
- 7 a) Draw the pin diagram of 74LS573 latch and explain how you can demultiplex the address and data bus using this latch. [8M]
- b) Explain the interfacing of 8051 with ADC 0803/0804/0805. [8M]

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