

Code No: R22A0409

R22

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

**B. Tech III Year II Semester Examinations,
MICROPROCESSORS AND MICROCONTROLLERS**

EEE

Time: 3 hours

Max. Marks: 60

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 10 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(10Marks)

- a) When does the 8086 processor is in minimum mode and maximum mode? [1]
- b) List different types of 8086 hardware interrupts. [1]
- c) Write the different logical instructions of 8086. [1]
- d) Give the advantages of assembly language over machine language. [1]
- e) Give the RS 232 Standard details. [1]
- f) List out the important features of the A/D converter. [1]
- g) What is push and POP instructions in 8051? [1]
- h) What is the difference between microprocessor and micro controller? [1]
- i) Draw the read cycle timing diagram for 8086 under minimum mode of operation. [1]
- j) How does effect the SBUF SFR in serial communications of 8051? [1]

PART-B

(50 Marks)

- 2.a) Explain the concept of segmented memory. What are the advantages? [5+5]
- b) Describe the implementation of pipelined process of 8086. [5+5]

OR

- 3. Explain the internal hardware architecture of 8086 microprocessor with neat diagram. [10]

- 4.a) Write an 8086 ALP to find the sum of numbers in the array of 10 elements. [5+5]
- b) Explain any five assembler directives of 8086 with suitable examples. [5+5]

OR

- 5.a) Write an assembly language program (ALP) which counts the number of A's and a's in a string of characters [5+5]
- b) Explain the function of the following instructions. [5+5]
 - i) AAD ii) MOVSB iii) LAHF
 - iv) JNZ v) LEA vi) DAD

- 6.a) Explain the briefly the different modes operation of 8255 PPI. [5+5]
- b) Draw and explain the synchronous mode transmitter and receiver data formats of 8251. [5+5]

OR

- 7.a) Write a program to interface 4×4 keyboard to 8086 through ports A and B operating at I/O base addresses 0FFF9. Draw the necessary interface details.
b) Explain the interfacing procedure of an 8 - bit DAC with 8086 microprocessor. [5+5]

- 8.a) Explain SCON register programming in 8051.
b) Write an ALP to generate the 1 kHz square wave form using mode 1 timer programming. [5+5]

OR

- 9.a) Explain the I/O pins ports and circuit details of 8051 with its diagram.
b) Write a program to multiply the data in RAM location 3AH by the number 11H. Put the result in R4 and R5 registers. [5+5]

- 10.a) Explain: i) TCON ii) TMOD registers in detail.
b) Discuss about 8051 serial port programming. [5+5]

OR

- 11.a) How does 8051 process generate the ISR address on an un-marked interrupt?
b) How does timer over flow interrupts differ from real time clocked interrupts? [5+5]

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PART- A

(10Marks)

- a) When does the 8086 processor is in minimum mode and maximum mode? [1]
- b) List different types of 8086 hardware interrupts. [1]
- c) Give the advantages of assembly language over machine language. [1]
- d) Give the RS 232 Standard details. [1]
- e) List out the important features of the A/D converter. [1]
- f) What is push and POP instructions in 8051? [1]
- g) What is the difference between microprocessor and micro controller? [1]
- h) Draw the read cycle timing diagram for 8086 under minimum mode of operation. [1]
- i) How does effect the SBUF SFR in serial communications of 8051? [1]
- j) How does effect the SBUF SFR in serial communications of 8051? [1]

PART-B

(50 Marks)

- 2.a) Explain the concept of segmented memory. What are the advantages? [5+5]
- b) Describe the implementation of pipelined process of 8086. [5+5]

OR

- 3. Explain the internal hardware architecture of 8086 microprocessor with neat diagram. [10]

- 4.a) Write an 8086 ALP to find the sum of numbers in the array of 10 elements. [5+5]
- b) Explain any five assembler directives of 8086 with suitable examples. [5+5]

OR

- 5.a) Write an assembly language program (ALP) which counts the number of A's and a's in a string of characters [5+5]
- b) Explain the function of the following instructions. [5+5]
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OR

- 11.a) How does 8051 process generate the ISR address on an un-marked interrupt?
- b) How does timer over flow interrupts differ from real time clocked interrupts? [5+5]

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PART-A**(10 Marks)**

- a) List the hardware and software interrupts of 8086 microprocessor. [1]
- b) What are the conditional and control flags of 8086 microprocessor? [1]
- c) Define macro with example. [1]
- d) Write instruction format of 8086 microprocessor. [1]
- e) Draw the frame format of I/O modes of 8255 PPI. [1]
- f) What are the methods of serial communication of 8251 USART? [1]
- g) Write briefly the evolutions of microcontroller. [1]
- h) Draw the frame format of PSW. [1]
- i) What is the serial communication interrupt of 8051 microcontroller? [1]
- j) List the various applications of 8051 microcontroller. [1]

PART-B**(50 Marks)**

- 2.a) Draw the internal architecture of 8086 microprocessor and explain its operation in detail.
- b) Draw the timing diagram of minimum mode read operation and explain its operation. [5+5]

OR

- 3.a) Write the advantages of memory segmentation of 8086.
- b) Draw and explain each signal function of 8086. [5+5]
- 4.a) Explain the different addressing modes used in 8086 microprocessor with examples.
- b) Explain the difference between procedure and macro used in 8086 microprocessor. [5+5]

OR

- 5.a) Write an assembly language program to find the sum of squares of first ten numbers.
- b) List out the shift and rotate instructions of 8086 microprocessor with examples. [5+5]

- 6.a) Draw the internal architecture of 8251 USART and explain its operation.
b) Draw the interrupt vector table and explain its operation. [5+5]
- OR**
- 7.a) Explain the interrupt service routines of 8086.
b) Draw the interfacing diagram of D/A converter with 8086 CPU and explain its operation. [5+5]
- 8.a) Explain the concept of memory organization of 8051 microcontroller.
b) Draw the frame format of SCON and PCON registers and explain it. [5+5]
- OR**
- 9.a) Draw the pin Diagram of 8051 microcontroller and explain the function of each pin in detail.
b) Draw the internal RAM organization of 8051 microcontroller and explain it. [5+5]
- 10.a) Define interrupt and Explain different software interrupts used in 8051 microcontroller.
b) Explain the concept of timers and counter of 8051 microcontroller. [5+5]
- OR**
- 11.a) List out the different instruction set of 8051 microcontroller and explain with examples.
b) Write an assembly language program for serial communication in 8051 microcontroller with suitable example. [5+5]

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