



# SRI VASAVI ENGINEERING COLLEGE

(Sponsored by Sri Vasavi Educational Society)

Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada  
Pedatadepalli, TADEPALLIGUDEM – 534 101, W.G. Dist, (A.P.)

Department of Electronics & Communication Engineering

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## Unit wise Question Bank

**Academic year: 2017-18**

**Year/Semester: III/I**

**Program: B Tech**

**Section: A, B & C**

**Course Title: Microprocessor & Microcontrollers**

**Branch: ECE**

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### UNIT-I

1. Draw the functional pin diagram of 8086 microprocessor and explain the functions of each pin.
2. Draw the block diagram of maximum mode operation of 8086 processor and explain
3. List and explain the general purpose registers of 8086 microprocessor. Also explain its special functions.
4. a) Draw the minimum mode Read operation timing diagram and its operation in detail.  
b) Explain the purpose of Flag register and how many conditional and control flags presented in 8086 Microprocessor.
5. a) Define addressing mode and explain the different addressing modes presented in 8086 Microprocessor with examples.  
b) Define assembler directive and explain different assembler directives used in 8086Microprocessor in detail.
6. Explain the concept of Physical memory organization of 8086 Microprocessor with example.
7. Discuss briefly about pre-fetch queue in 8086.
8. Explain the physical address formation in different addressing modes.
9. The architectural differences between 8086 and 8088.

### UNIT-II

1. Write an assembly language program in 8086 to perform addition, subtraction,
  - a. multiplication and division of the given operands. Perform BCD operation for addition
  - b. and subtraction.
2. a) Draw and discuss interrupt structure of 8086 in detail.  
b) Describe the procedure to code intersegment jump and intra segment jump.
3. a)Write an ALP to convert an 8 bit binary number into its equivalent gray code.  
b) Explain the structure of stack of 8086 and write the instructions to exchange the contents of a register pair using PUSH and POP instructions.  
c) Explain the transfer of control during the execution of an ISR.
4. a)Explain about the following assembler directives of 8086 microprocessor
  - i) EQU ii) EXTRN iii) SEGMENT iv) PUBLIC v) TYPE



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- b) Write a recursive procedure to calculate the factorial of number N, where N is a two-digit Hex number.
5. a) Write an assemble language program to arrange the given array in ascending order, the length of array is ten 16-bit numbers.
6. Draw the interrupt cycle of 8086 Microprocessor and explain the nested interrupt concept in detail.
7. a) Explain the shift and Rotate instruction set of 8086 Microprocessor along with examples.  
b) List out the different mask able and non-mask able interrupt of 8086 Microprocessor and explain its importance.
8. a) Define Interrupt and explain the interrupt services routines in 8086 Microprocessor.  
b) Write an assemble language program to find the sum of the squares of first ten numbers.
9. a) Draw the stack structure of 8086 Microprocessor and explain its need while presenting an interrupt.  
b) Write an assemble language program for finding the Largest number in an Array, the length of array is ten 16-bit numbers.
10. Define interrupt and explain the different interrupts presented in 8086 microprocessor.
11. What do you mean by a Macro? What are the differences between a Macro and a subroutine?
12. What is a recursive procedure? Write a recursive procedure to calculate the factorial of number N, where N is a two-digit Hex number.
13. a) Explain how multiplexing is implemented in 8086?  
b) What are the differences between mask able and non-mask able interrupts? Give with suitable examples.
14. a) Write an ALP to perform one byte BCD addition.  
b) Draw and discuss the interrupt acknowledge sequence of 8086.  
c) Explain the term nested interrupt.
15. a) Write an ALP to convert a BCD number in to its equivalent binary number.  
b) Explain the interrupt response sequence of 8086.  
c) Write the role of stack in calling a subroutine and returning from a subroutine.

### UNIT-III

1. a) Write the salient features of strobed I/O mode of operation of 8255. Also present the input and output control signal definitions.  
b) Design an interface between 8086 CPU and two chips of 16K X 8 EPROM and two chips of 32K X 8 RAM. Select the starting address of EPROM suitably. The RAM address must start at 00000H.
2. a) Draw and explain the internal architecture of 8257.  
b) Explain the initialization sequence of 8259A using a flow chart.  
c) Explain the FIFO status word of 8279.
3. Interface DAC AD7253 with an 8086 CPU running at 8 MHz and write an ALP to



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- generate a sawtooth waveform of period 2 ms with  $V_{max}=5V$ . (7+8)
4. Draw the architectural block diagram of 8251A and write its signal descriptions.
  5. a) Explain the working of 8257 DMA controllers.  
b) Write a program to initialize 8251 in asynchronous mode with even parity, 7 bit data character, 2400bd.
  6. a) Draw the functional diagram, pin diagram of ADC0808, and explain its operation along with interfacing diagram.  
b) Write short notes on control of high power devices using 8255 programmable peripherals input output port.
  7. a) Draw the Internal architecture of 8259 Programmable interrupt controller and explain the operation of each block in detail.  
b) Explain the different operating modes of 8259 Programmable interrupt controller in detail.
  8. Design a stepper motor controller and write an ALP to rotate shaft of a 4-phase stepper Motor with 200 rotor teeth, for rotations through an angle of 1350 in 2 seconds.
  9. Explain briefly about
    - (a). Serial communication standards
    - (b). Prototyping
  10. (a) Describe the operation of 8279 with a neat block diagram.  
(b) Determine the seven segment codes you would have to send to the 8279 in SDK-86 to display the letters 8086.
  11. (a) Why do we need wait state and explain how wait states are generated.  
(b) What is the function of BS and AACK/XACK pins of 82C08(DRAM controller).
  12. (a) Describe the important pins of 8237.  
(b) Draw and explain the architecture of 8237A.
  13. Interface a 12-bit DAC to 8255 with an address map of 0C00H to 0C03H. The DAC provides output in the range of 5V to -5V. Write the instructions sequence.

### UNIT-IV

1. (a) What is meant by paging? Explain its advantages and disadvantages.  
(b) Explain the procedure of converting linear address into physical address.
2. List three major advantages that the 80386 microprocessor has over the 80286.
3. a) Explain the structure of an 80386 descriptor and discuss different descriptor types supported by 80386.  
b) What are the different exceptions generated by 80386?  
c) Write the advantages and disadvantages of paging?
4. Draw the flag register of 80386 processor and Explain the register organization of this processor.
5. a) Explain the concept of Real and protected modes of an 80386 processor along with circuit diagram.  
b) Explain the different instruction set of an 80386 processor along with examples.
6. a) Explain different data types and addressing modes used in 80386 processor with



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examples.

- b) Briefly explain the features of an 80486 processor and also compare with an 80386 processor.
7. Draw the EFLAG register of 80386 processor and explain the function of each flag with example.
8. (a) Discuss briefly about memory addressing in real mode of 80386.  
(b) What are the salient features of 80836 microprocessor?
9. (a) Give the formats for control and status registers of 80387 and explain each bit.  
(b) Briefly explain about the concept of paging in 80386 processor.
10. a) Explain the memory management unit and special function register of 80386 processor  
b) Explain the advantages of RISC over CISC processor.

## UNIT-V

1. (a)What is a microcontroller? With a neat block diagram, explain the architecture of 8051 microcontroller.  
(b) Explain the interrupt structure of the 8051 microcontroller.
2. a)Explain the RAM organization in 8051 microcontroller.  
b) List the special function registers of 8051 and explain them.
3. Explain different addressing modes of 8051 using relevant example instructions.
4. Explain the internal RAM organization of 8051.
5. a)Explain the different addressing modes of 8051 Microcontroller along with examples.  
b) Explain the structure of Program Status Word register of 8051.
6. Explain the following special function registers of 8051 microcontroller  
(i) SCON (ii) TMOD (iii)PSW (iv) TCON
7. (a) Write an 8051 subroutine to control the 7-segment display operation?  
(b). Explain the addressing modes of 8051?
8. Discuss in detail about serial port operation in 8051 microcontroller.
9. Draw the pin diagram of 8051 microcontroller and explain the function of each pin in detail.
10. a)Explain the timer modes in 8051 controller.  
b) Draw the structures of TMOD and TCON registers and explain.
11. a) Explain different program branching instructions supported by 8051.  
b) Explain any five Boolean variable mapping instructions.

## UNIT-VI

- 1.a) Draw the pin diagram of PIC 16C61 controller and explain the function of each pin in detail.  
b) Explain the different interrupts presented in PIC 16C61 controller in detail.



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2. a) Discuss the following CPU registers of PIC 16CX/7X i) FSR ii) INDF iii) PCLATH  
b) Write the features of 16F8XX flash microcontrollers.
3. Discuss in detail ARM architecture and organization.
4. a) Explain the bus architecture of an ARM processor.  
b) Write a program to sort 'N' number of data.
5. a) Explain the modes of operation of timer in a PIC microcontroller.  
b) Discuss about the VART interface of PIC microcontroller.
6. a) How many timers does PIC contain? Explain timer operation.  
b) Draw and explain program memory organization of stack of PIC 16c61.
7. a) Explain the operating modes of ARM processor.  
b) Briefly explain the concept of instruction level parallelism.
8. a) Explain the addressing modes of an ARM processor.  
b) Write a program to find the cube of a given number using lookup table method.
9. a) Discuss briefly the architecture of PIC microcontroller.  
b) Write a note on A/D converter and PWM in PIC microcontroller environment.
10. a) Draw the format of program status register of ARM controller and explain the function of each bit in detail.  
b) Explain the different ARM Instruction set of ARM processor and explain each instruction with example.
11. Write an notes on:
  - (i) I/O ports PIC16C6X and PIC16F87X .
  - (ii) PSP in PIC16C6X and PIC16F87X .
12. (a) Compare ARM design and RISC design.  
(b) Explain in detail about ARM Core Dataflow Model.
13. a) Discuss bit wise operations and increment, decrement operations of PIC 16C6X/7X.  
b) Discuss the timer 0, 1 and 2 operations and write the steps to initialize them stating appropriate control words in the associated SFRs.