**SIDDHARTH GROUP OF INSTITUTIONS:: PUTTUR (AUTONOMOUS)**

Siddharth Nagar, Narayanavanam Road – 517583

**QUESTION BANK (DESCRIPTIVE)**

**Subject with Code:** Microprocessors and Microcontrollers (18EC0420)

**Year & Sem:** III-B.Tech & II-Sem

**Course & Branch**: B.Tech – ECE

**Regulation:** R18

UNIT –I

**MICROPROCESSORS, MICROCOMPUTERS AND ASSEMBLY LANGUAGE**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | a) List out some examples of high level languages. | [L1][CO1] | **[2M]** |
| b) Define machine language. | [L1][CO1] | [2M] |
| c) List out the MPU performs primary four operations. | [L1][CO1] | [2M] |
| d) Calculate the address lines required for an 8 KB memory chip. | [L1][CO1] | [2M] |
| e) Give the importance of the input and output devices. | [L1][CO1] | [2M] |
| 2 | a) Define microprocessor. Explain the brief history of evolution of µP.b) Draw the block diagram of microcomputer and explain function of each block. | [L1][CO1][L2][CO1] | [5M]**[5M]** |
| 3 | Define instruction and explain different type’s instructions supported by µP. | [L1][CO1] | **[10M]** |
| 4 | a) What is the need of memory? And classify different types of memory. b)Compare RAM and ROM memories. | [L1][CO1][L1][CO1] | **[5M]****[5M]** |
| 5 | With a neat sketch explain the operation of Microprocessor Controlled Temperature System (MCTS) | [L1][CO1] | **[10M]** |
| 6 | a) Write short notes on input devices.b) Briefly explain different computer languages. | [L1][CO1][L1][CO1] | **[4M]****[6M]** |
| 7 | a) Write short notes on output devices.b) Compare static RAM and Dynamic RAM | [L1][CO1][L1][CO1] | **[5M]****[5M]** |
| 8 | With a neat sketch explain any example of a microcomputer system. | [L1][CO1] | **[10M]** |
| 9 | Explain how computers are classified from large computers to single chip microcontrollers. | [L1][CO1] | **[10M]** |
| 10 | a) Differentiate between µP & µC.b) Explain the terms i) SSI ii) MSI iii) LSI iv) VLSI v) ULSI | [L1][CO1][L1][CO1] | **[5M]****[5M]** |
| 11 | a) Draw and explain the basic architecture of a microprocessor.b) Define the terms: i) BIT, ii) NIBBLE, iii) BYTE & iv)WORD | [L1][CO1][L1][CO1] | **[6M]****[4M]** |

UNIT –II

# 8085 MICROPROCESSOR ARCHITECTURE

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | a) How many lines used for data bus and address bus of 8085 microprocessor? | [L1][CO1] | **[2M]** |
| b) Give the function of timing and control unit of 8085 microprocessor. | [L1][CO1] | [2M] |
| c) Find the content of the Accumulator after executing MOV A, B  if A=02 H, B=00 H. | [L1][CO1] | [2M] |
| d) Define machine cycle and instruction cycle. | [L1][CO1] | [2M] |
| e) Give the significance of instruction decoder. | [L1][CO1] | [2M] |
| 2 | a) List out the important features of 8085 microprocessor.b) Sketch neat block diagram of 8085 microprocessor. | [L2][CO2][L1][CO1] | [5M]**[5M]** |
| 3 | a) Explain the requirement of a program counter, stack pointer & ALU in 8085µP.b) Draw and define the flags in 8085μp. | [L1][CO1][L2][CO2] | **[5M]****[5M]** |
| 4 | a) Draw the pin diagram of 8085 µP.b) Define the following pins: i) READY ii) ALE iii) RESET OUT iv) HOLD & HLDA. | [L2][CO2][L1][CO1] | **[5M]****[5M]** |
| 5 | a) Explain briefly the control & status signals in 8085µP. b)Define and explain the different types of interrupts available in 8085 µP.  | [L2][CO2][L2][CO2] | **[5M]****[5M]** |
| 6 | Explain in detail how a data flow from memory to Microprocessor Unit. | [L2][CO2] | **[10M]** |
| 7 | a) Explain the concept of De-multiplexing the Bus AD7-AD0.b)Classify the register set in 8085µP.  | [L2][CO2][L2][CO2] | **[6M]****[4M]** |
| 8 | Explain the following instructions of 8085 microprocessor with an example.a) Data transfer instructions b) Logical instructions.  | [L2][CO2] | **[5+5M]** |
| 9 | Explain the following instructions of 8085 microprocessor with an example.a) Arithmetic instructions b) Stack control instructions. | [L2][CO2] | **[5+5M]** |
| 10 | 1. a) Define instruction.

b) Explain the instruction, data formats & data storage in 8085 µP. | [L1][CO2][L2][CO2] | **[3M]****[7M]** |
| 11 | a) Describe how timing and control signals are generated in 8085 µP.b) Explain what operation will take place when the following instructions are executed**:** i) RAL ii) RLC iii) DAD  | [L1][CO2][L1][CO2] | **[5M]****[5M]** |

UNIT –III

# THE 8051 ARCHITECTURE

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | a) Define microcontroller. | [L1][CO1] | **[2M]** |
| b) Give the function of Port 0 of 8051 µC. | [L1][CO1] | [2M] |
| c) How many oscillators used in 8051 µC and give its operating frequency. | [L1][CO1] | [2M] |
| d) List out the 8051 µC five interrupts. | [L1][CO1] | [2M] |
| e) Draw the configuration of TCON register. | [L1][CO1] | [2M] |
| 2 | With the help of neat diagrams, Describe the differences between microprocessors and microcontrollers. | [L4][CO3] | [10M] |
| 3 | a) List the features of 8051 microcontroller. [L1][CO3][8M]b) Mention the applications of microcontrollers in everyday life. | [L1][CO3][L4][CO3] | **[4M]****[6M]** |
| 4 | With the help of a neat block diagram, Explain the internal architecture of 8051 microcontroller in detail. | [L2][CO3] | **[10M]** |
| 5 | a) Define register. Mention the need of registers in µP or µC.b) Draw the flag register of 8051 µC and describe the functionality of each flag in detail | [L2][CO3][L2][CO3] | **[5M]****[5M]** |
| 6 | Mention the various registers present in 8051 µC and explain their functionality in detail | [L2][CO3] | **[10M]** |
| 7 | Draw the pin diagram of 8051 µC and describe the functionality of each pin in detail. | [L2][CO3] | **[10M]** |
| 8 | a) Mention the importance of I/O port in a µP or µC.b) Describe the functionality of I/O ports present in 8051 µC. | [L4][CO3][L4][CO3] | **[4M]****[6M]** |
| 9 | a) Explain the importance of memory in a µP or µC.b) Describe how the memory is organized in 8051 µC in detail. | [L2][CO3][L4][CO3] | **[4M]****[6M]** |
| 10 | a) Define counter. Mention the applications of counterb) Describe the operation of timers present in 8051µC. | [L2][CO3][L2][CO3] | **[4M]****[6M]** |
| 11 | a) Compare serial communication and parallel communication.b) Explain how the 8051 µC transfers the data using serial port. | [L5][CO3][L2][CO3] | **[4M]****[6M]** |

UNIT –IV

# PROGRAMMING THE 8051

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | a) Classify addressing modes of 8051 µC. | [L1][CO1] | **[2M]** |
| b) Give the examples for logical operations of 8051 µC. | [L1][CO1] | [2M] |
| c) List the importance of DAA instruction. | [L1][CO1] | [2M] |
| d) What is the role of NOP in 8051 µC. | [L1][CO1] | [2M] |
| e) Compare RLC A and RRC A. | [L1][CO1] | [2M] |
| 2 | a) Write a short note on assembly language programming.b) Explain the moving data instructions of 8051 µC with an example. | [L1][CO4][L2][CO4] | [4M]**[6M]** |
| 3 | a) Define addressing mode.b) List various addressing modes of 8051 microcontroller and explain them with an example each.  | [L1][CO4][L4][CO4] | **[3M]****[7M]** |
| 4 | a) Mention various logical operations performed in assembly language.b) Explain the logical Instructions of 8051 µC with an example. | [L2][CO4][L2][CO4] | **[4M]****[6M]** |
| 5 | Explain the following operators of 8051 µC with an example.(i) Bit level (ii) Byte level | [L2][CO4] | **[12M]** |
| 6 | a) Mention the difference between Jump and Call operations.b) Explain Jump and Call instructions of 8051 µC with an example. | [L1][CO4][L2][CO4] | **[4M]****[6M]** |
| 7 | Write an assembly program of 8051 µC to multiply two 8-bit numbers and store the result in a memory location. | [L4][CO4] | **[10M]** |
| 8 | a) Mention various arithmetic operations performed in assembly language.b) Explain the arithmetic Instructions of 8051 µC with an example. | [L2][CO4][L2][CO4] | **[4M]****[6M]** |
| 9 | a) Describe the operation of return instruction in 8051 µC with suitable example.b) Explain how the 8051 µC performs rotate and swap operations with an example. | [L2][CO4][L2][CO4] | **[3M]****[7M]** |
| 10 | a) Write an assembly program of 8051 µC to divide two 8-bit numbers and store the result in a memory location. b)Write an assembly program of 8051 µC to subtract two 8-bit numbers and store the result in a memory location.  | [L2][CO4][L2][CO4] | **[5M]****[5M]** |
| 11 | a) Write an assembly program of 8051 µC to logically AND two 8-bit numbers and store the result in a memory location. b)Write an assembly program of 8051 µC to logically OR two 8-bit numbers and store the result in a memory location.  | [L2][CO4][L2][CO4] | **[5M]****[5M]** |

UNIT –V

**APPLICATION**

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| --- | --- | --- | --- |
| 1 | a) What is matrix keypad and give its use. | [L1][CO1] | **[2M]** |
| b) Classify the seven segment displays. | [L1][CO1] | [2M] |
| c) Give the different methods to implement switch debouncing. | [L1][CO1] | [2M] |
| d) List out the features of ADC 0808. | [L1][CO1] | [2M] |
| e) Define switch bounce. | [L1][CO1] | [2M] |
| 2 | a) With a neat diagram, show the interfacing of a 4x4 matrix keypad with 8051 µC.b) Describe key bouncing problem and de-bouncing solutions. | [L4][CO5][L6][CO5] | [5M]**[5M]** |
| 3 | Describe with a schematic, the scanning of the 4x4 matrix keyboard in an 8051 based system and identifying the key pressed. | [L4][CO5] | **[10M]** |
| 4 | a) Write a short note on LCD Display.b) With the help of a neat diagram show the interfacing of LCD Display with 8051 µC and explain its operation. | [L1][CO5][L4][CO5] | **[3M]****[7M]** |
| 5 | a) List instruction command codes for programming an LCD.b) List the merits, demerits and applications of an LED display over an LCD. | [L1][CO5][L4][CO5] | **[6M]****[4M]** |
| 6 | a) List the features of 16X2LCDdisplay.b) Draw and explain the pin Diagram of 16x2LCD display. | [L4][CO5][L2][CO5] | **[3M]****[7M]** |
| 7 | a) Write a short note on7-Segemnt display.b) With the help of a neat diagram, show the interfacing of 7- segment display with 8051 µC and explain its operation. | [L3][CO5][L2][CO5] | **[3M]****[7M]** |
| 8 | a) Write a short note on Analog to Digital Converter.b) With the help of a neat diagram, show the interfacing of ADC 0808 with 8051 µC and explain its operation. | [L1][CO5][L2][CO5] | **[3M]****[7M]** |
| 9 | a) Define Interrupt and classify the interrupts.b) Explain multiple interrupts present in8051µC. | [L1][CO5][L2][CO5] | **[4M]****[6M]** |
| 10 | Design and explain any microcontroller-based system. | [L4][CO5] | **[10M]** |
| 11 | Design and explain the implementation of 4-way traffic control system using 8051 microcontroller. | [L4][CO5] | **[10M]** |