Microprocessors and Microcontrollers

Assignment 1:

1. List out the mass storage devices and their characteristics.
2. List the current workstations available in the market for graphics and business applications.
   Benchmark the specifications of those workstations.
3. Write a note on IBM mainframes.
4. Discuss the different types of SCSI with examples.
5. Differentiate between RISC and CISC computers with examples.
6. Bring out the differences between SMP and MPP.
7. What is a supercomputer? List the different supercomputers that India has indigenously designed and built.
8. Mention the different applications of DSP.
9. List out the computers that are designed based on Von Neumann and Harvard architecture based computers.

Assignment 2:

10. Write a note on 32-bit microcontroller.
11. Write a note on wireless microcontrollers.
12. Write a note on DSP processors.
13. Compare various 8-bit microprocessors.
15. List and discuss the various applications of microprocessors.
16. Write a note on applications of microcontroller.
17. What are the advantages and disadvantages of 8-bit microprocessors? Explain.
18. Explain the different steps involved in instruction execution with example.
19. List out the different flags in 8085 and state examples to illustrate the use of various flags in the execution of the program.
20. With the help of the diagram, illustrate the use of different types of memory in 8085.
21. Explain the process of interrupt handling in microprocessor.
22. Differentiate between maskable and non-maskable interrupts.
23. What are the limitations of 8085 instructions? List them.
24. Give examples for all types of addressing modes supported in 8085.

Assignment 3:

25. Write a note on DOS interrupts.
26. Write a note on BIOS interrupts.
27. List all the BIOS interrupts.
28. List and discuss the DOS interrupts for file operations.
29. Give examples for DOS interrupts to handle character input and output.
30. Name the DOS interrupts for time and date services.
31. Give examples for cursor setting using BIOS interrupts.

Assignment 4:

32. List out the drawbacks of 8-bit microprocessors.
33. Bring out the advantages of 16-bit microprocessors.
34. Explain the advantages of 8086 microprocessor with 8085.
35. List out the minimum and maximum mode pins found in 8086.
36. List out the common pins used in both minimum and maximum modes of operations.
37. What is instruction pipelining? How is the architecture of 8086 support it? Explain.
38. What is memory segmentation? How it is implemented in 8086? Explain with illustration.
39. What is the difference between physical address and effective address? Explain how physical address is calculated in 8086.
40. With an example, illustrate the operations on stack in 8086.
41. Is overlapping of segments allowed in 8086? If so, illustrate with an example.
42. How many segments can be used at a time in 8086? Explain.
43. What are the advantages and disadvantages of memory segmentation? Discuss.
44. Explain the meaning of clock, clock cycle, machine cycle, T-state and Instruction cycle.
45. Give examples for all addressing modes of 8085 microprocessor.
46. Give examples for all addressing modes of 8086 microprocessor.
47. Discuss how instruction pipelining is achieved in 8086 architecture.
48. Explain the operations of pre fetch queue in 8086 processor.
49. Discuss the data transfer instructions with examples in 8086 processor.
50. Compare the instruction set of 8085 and 8086 processors.
51. Compare the addressing modes supported in 8085 and 8086 processors.

Assignment 5:

52. Differentiate BIU and EU units of 8086 processor.
53. Discuss the memory bank organization in 8086 processor.
54. Compare the memory bank organizations in Intel microprocessors.
55. Discuss the main features of various microprocessors of Intel.
56. Discuss the flag structure in various microprocessors of Intel.
57. Write the timing diagram for memory read and write cycles in 8086.
58. Write the timing diagram for I/O read and write cycles in 8086.

Assignment 6:

59. Explain the interrupt cycle in 8086.
60. Discuss the status information available in 8086 processor.
61. Differentiate between single processor and multi-processor systems.
62. Indicate the usage of two code and one data segment by one single program.
63. Illustrate the use of BHE and A0 pins in 8086 memory accessing.
64. What is an interrupt vector? Explain how to access it?
65. What are processor exceptions? Explain in detail with examples. Also discuss when they occur?
Assignment 6: (Answer the questions from 66 to 72; 75 to 77 with respect to 8086)

66. List out all instructions related to data conversion and give examples for those instructions.
67. Differentiate between logical and arithmetic instructions.
68. Indicate the additional role of shift and rotate instructions.
69. List out the instructions according to the formats.
70. Differentiate between signed arithmetic and unsigned arithmetic instructions.
71. Discuss the flag manipulation instructions.
72. Give examples for I/O instructions.
73. Discuss the 8-bit and 16-bit I/O instructions.
74. List out the flag manipulation instructions in 8086.
75. List out the instructions which have implied operands.
76. Differentiate between logical and arithmetic shift operations.
77. Explain how some of the important registers used in instructions.
78. Bring out the importance of REP prefix.
79. What are I/O ports? Explain how they are addressed?
80. Illustrate the use of XLAT instruction in table lookup.
81. What are the uses of various END directives? Explain.
82. Illustrate the use of DUP directive with examples.
83. How is location counter affected by Define and Origin directives? Explain.

Assignment 7:

84. Discuss the different types of unconditional instructions.
85. Write a note on instruction encoding.
86. Write a note on control transfer instructions.
87. What are delay routines? How are they useful in interfacing?
88. Discuss how looping is done in assembly programming.
89. How conditional branching is written in assembly programming? Discuss.
90. Write a note on string instructions in 8086 processor.
91. Write note on assembler directives.

Assignment 8:

92. List out the various EPROM chips in the market. Indicate their specifications.
93. What is memory address decoding? Explain the different steps involved in memory interfacing.
94. Identify the various SRAM and DRAM chips in the market and give their specifications.
95. Differentiate between BSR mode and I/O modes of operation in 8255.
96. Explain the different modes of operation of 8255.
97. List out the various controller chips used with microprocessor to build a system. Explain the uses of it.
98. Write the control word for 8255 to configure in I/O mode, with Port A input, port B output and both in simple I/O mode.

Assignment 9:

99. Write the control word for setting PC1 bit in 8255 using BSR mode.
100. List out all the operating modes of 8254. Explain each one of them.
101. Write the timing diagram for Mode 0 of 8254 and explain.
102. Identify the difference in the timing diagrams of modes of 8254.

Assignment 10:

103. Give the pin details of 8279. Explain how they are useful in interfacing?
104. Write a note on modes of operation in 8279.

Assignment 11:

105. Explain the internal architecture of 8259 chip.
106. What are ICWs? Explain the different ICWs in 8259.
107. What are OCWs? Explain the different OCWS present in 8259.
108. Give the initialization sequence of 8259.
110. What is the difference between edge and triggered modes in 8259? Explain.

111. Write a note on special fully nested mode in 8259.

112. What are the different modes of operations of 8259? Explain.

Assignment 12:

113. How to interface the keyboard to the microprocessor? Explain.

114. Explain the process of key detection using a flowchart.

115. Discuss the various steps involved in interfacing with alphanumeric displays.

116. How to interface a LCD with the microprocessor?

Assignment 13:

117. Write short notes on interfacing of ADC with microprocessor.

118. List out the pins of ADC 0808 and explain their functions.

119. Write the timing diagram of ADC 0808.

120. List out the various ADC available in the market with their specifications.

121. Write note on DAC.

122. Mention the pin details of AD 7523 along with their functions.

Assignment 14:

123. Give the pin details of 8087.


125. Write the block diagram of 8087 and explain the parts.

126. Give the structure of 8087 status register.

127. Explain the structure of 8087 control register.

128. What are the data types supported by 8087? Give examples.

129. List out all the arithmetic instructions of 8087.

130. Write short notes on the comparison instructions of 8087.
Assignment 15:

131. Give the internal architecture of 8051 microcontroller.
132. Give the block diagram of MSC 96.
133. Discuss the different peripherals of 8096.
134. Give the structure of chip configuration byte of 8096.
135. Write the timing diagram for expand mode with 16 bit multiplexed bus in 8096.
136. Give the expanded memory map of 8096.
137. List out the instructions of 8051 for arithmetic operations.
138. List out the assembler directives used for 8051.
139. Compare 80386 and 80486 microprocessor.