

Time: 3 Hours

DECEMBER 2011

Max. Marks: 100

NOTE: There are 9 Questions in all.

- Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.
- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. The internal clock frequency and the fabrication technology of 8085A microprocessor is

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|--------------------|--------------------|
| (A) 5 MHz and HMOS | (B) 5 MHz and NMOS |
| (C) 3 MHz and NMOS | (D) 3 MHz and HMOS |

b. XTHL instruction exchanges the contents of

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|--|
| (A) DE with HL |
| (B) Top two contents of stack locations with contents of HL |
| (C) Bottom two contents of stack locations with contents of HL |
| (D) Program counter contents with contents of HL |

c. RST 7.5 is _____ triggered interrupt.

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|----------------------|------------------------|
| (A) Edge | (B) Level |
| (C) Both (A) and (B) | (D) None of the above. |

d. The port used to configure 8255 in bidirectional I/O is

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|------------|------------|
| (A) Port-0 | (B) Port-A |
| (C) Port-B | (D) Port-C |

e. The program counter (PC) in a microprocessor

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| (A) Counts the number of programs being executed on the microprocessor |
| (B) Counts the number of instructions being executed on the microprocessor |
| (C) Counts the number of stack instructions being executed on the microprocessor |
| (D) keeps the address of the next instruction to be fetch |

- f. When a microprocessor system is undertaking data transfer under DMA scheme CPU will
- (A) carry out usual data processing
 - (B) route data to the desired memory location pointed out by the program counter
 - (C) route data to the desired I/O device
 - (D) remain idle and do nothing
- g. Which of the data transfer is not possible in a microprocessor?
- (A) memory to accumulator
 - (B) accumulator to memory
 - (C) memory to memory
 - (D) I/O Device to accumulator
- h. The data bus in a microprocessor based system is used for data transfer
- (A) between the microprocessor and I/O device
 - (B) between the microprocessor and memory
 - (C) between the I/O device and microprocessor
 - (D) all of the above
- i. Programmable interval timer 8253 has a maximum count rate of
- (A) 1 MHz
 - (B) 10 MHz
 - (C) 2 MHz
 - (D) 4 MHz
- j. Which of the following SFRs of 8051 are one bit addressable?
- (A) PSW
 - (B) Accumulator
 - (C) Timer counter (TCON)
 - (D) All of the above

**Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.**

- Q.2** a. What are the needs of addressing modes? Explain different types of 8085 addressing modes. (8)
- b. With an example explain the working of the following instructions:
- (i) MOV R, M
 - (ii) XCHG
 - (iii) LDAX R_P
 - (iv) DAD R_P
- (8)
- Q.3** a. Compare memory mapped I/O with I/O mapped I/O. (6)
- b. Mention the steps involved in an instruction cycle and explain the steps with an example (10)

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- Q.4** a. Write an 8085 ALP to search a given byte in an array of bytes using linear search algorithm by considering location X for size of an array, X+1 for elements to be searched and from Y onwards for the elements. (8)
- b. Write an 8085 ALP to convert an 8-bit binary number stored in memory location X to equivalent BCD number. (8)
- Q.5** a. What is the purpose of SIM instruction? With the format explain SIM instruction. (8)
- b. Discuss the action taken by 8085 when INTR pin is activated. (8)
- Q.6** a. Write an 8085 ALP to implement a decimal up counter using logic controller interface. (8)
- b. Write a circuit diagram to interface a simple keyboard using tristate buffers. What are the drawbacks of this method? (8)
- Q.7** a. Briefly describe the functions of 8259 pins. (8)
- b. What is the need for DMA data transfer? Provide an overview of the working of 8257 DMA controller. (8)
- Q.8** a. Configure control port of 8253 in mode3 to count decimal numbers in counter1 and explain with neat waveforms mode3 operation of 8253. (8)
- b. Describe synchronous data transmission and asynchronous data reception of 8251. (8)
- Q.9** a. Discuss the important features of 8051 microcontroller. (6)
- b. Write 8051 ALP to convert 4-digit hexadecimal number to equivalent ASCII number. (6)
- c. Explain the various bits available in PSW register. (4)