Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V(New) • EXAMINATION – WINTER 2016

Subject Code:2152006 Date:22/11/2016

Subject Name:Basics of Micro Computer Systems

Time:10:30 AM to 01:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

MARKS

Q.1 Short Questions & MCQ. 14

1 Give the bit pattern of PSW register for the microprocessor 8085.

2 If a microprocessor is capable of addressing 1 MB memory, the width of its address bus is
(a) 16-bit (b) 10-bit (c) 20-bit (d) 22-bit

3 For the microprocessor 8085, which of the following instruction is not a valid instruction?
(a) STAX H (b) STAX B (c) STAX D (d) BOTH a AND c

4 In the microprocessor 8085, when the CALL instruction is executed, the content of the stack pointer will
(a) Incremented by two (c) Decremented by two
(b) Incremented by one (d) Decremented by one

5 Which of the following instructions can be used to clear the content of Accumulator in the microprocessor 8085?
(a) ANA A (b) XRA A (c) ORA A (d) ORI 00H

6 For the microprocessor 8085, which of the following instruction will require more than 7 T-states?
(a)MVI B,09H (b)ADI 09H (c)MVI M,09H (d) MVI C,09H

7 For the microprocessor 8085, which of the following instruction will not alter any of the flag bit?
(a) ADI 20H (b) MVI A,09H (c) ORI 10H (d) ORA B

8 In the microcontroller, a stack is implemented in
(a) External RAM (b) Internal RAM
(c) Internal ROM (d) External ROM

9 Stack pointer in the 8051 is
(a) 8-bit register (b) 4-bit register
(c) 16-bit register (d) none of the above

10 What is the size of internal RAM in the microcontroller 8051?
(a) 64 bytes (b) 64 KB (c) 128 bytes (d) 128 KB

11 An alternate function of P3.4 in the microcontroller 8051 is related to
(a) Timer 0 (b) Timer 1 (c) Interrupt 0 (c) Interrupt 1

12 In the microcontroller 8051, which of the following port does not have a dual purpose role?
(a) port 0 (b) port 1 (c) port 2 (d) port 3

13 In the microcontroller 8051, after RESET, the SP is initialized to the address
(a) 08H (b) 07H (c) 09h (d) 06H

14 Which of the following is an invalid count for BCD counter?
(a) 0010 (b) 1100 (c) 0101 (d) 1000

Q.2 **(a)** List various vectored interrupt in the microprocessor 8085 and explain any one of them in detail. **03**

(b) Explain internal bus structure of the microprocessor 8085 using suitable diagram. **04**

(c) Draw and explain timing diagram for the instruction MVI C,06H written from the memory location 2010H onwards. **07**

OR

(c) For the microprocessor 8085, design and explain interfacing diagram to interface 7-sagment common cathode LED display. The address to display single digit number on the display must be F0H. **07**

Q.3 **(a)** Give the format of the instruction CALL for the microprocessor 8085. When a CALL instruction is executed by the microprocessor 8085, what will happen with the content of the stack pointer and program counter? **03**

(b) An 8-bit HEX number is stored in the memory location 2070H. Write an assembly language program based on the microprocessor 8085 to find out 2's complement of the number and store the answer in the memory location 2071H. **04**

(c) N numbers are stored in the memory locations starting from 3000H. The value of N is stored in the memory location 2020H. Write an assembly language program for the microprocessor to arrange this numbers in ascending order and store the answer in the memory locations 3000H (i.e. in the same memory locations). **07**

OR

Q.3 **(a)** What is stack? Explain instruction to initialize the stack location in the microprocessor 8085. **03**

(b) For the microprocessor 8085, write an assembly language program to generate time delay of 0.5 seconds for the crystal frequency of 6.144 MHz. **04**

(c) An 8-bit HEX number is stored in the memory location 2060H. Write an assembly language program for the microprocessor 8085 to convert this number in decimal format and store the answer in the memory locations 3000H (two lower digits) and 30001H (third digit). **07**

Q.4 **(a)** Give the list of various interrupts of the microcontroller 8051 with their priorities. **03**

(b) Explain TCON register in the microcontroller 8051. **04**

(c) Draw and explain architectural block diagram of the microcontroller 8051. **07**

OR

Q.4 **(a)** Explain IE register in the microcontroller 8051. **03**

(b) List various addressing modes of the microcontroller 8051 and explain any one in detail using suitable example. **04**

(c) Explain structure of port 0 in the microcontroller 8051 using suitable diagrams. **07**

Q.5 **(a)** An 8-bit HEX number is stored in the external RAM location 3000H. Write an assembly language program for the microcontroller 8051 to mask the lower nibble and store the answer in internal RAM location 40H. **03**

(b) What is jump range? For the microcontroller 8051, explain short absolute, long **04**

absolute and relative jump using appropriate instruction.

	(c)	Write an assembly language program for the microcontroller 8051to generate rectangular waveform on P0.3 with 66% duty cycle and time period of 1 msec. Assume crystal frequency of 12MHz.	**07**

OR

Q.5	**(a)**	Write an assembly language program for the microcontroller 8051 to divide the data in RAM location 40H by the data in RAM location 45H and store quotient and reminder in RAM locations 50H and 51H respectively.	**03**
	(b)	Explain following instructions using suitable examples. (1) DJNZ (2) LJMP	**04**
	(c)	10 number of data bytes are stored in external RAM locations starting from 3000H. Write an assembly language program for the microcontroller 8051 to add these data bytes and store the result in the internal RAM locations 60H (carry of the answer) and 61H (answer).	**07**

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