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Total Number of Pages: 02

B.Tech.  
PEI51102

5<sup>th</sup> Semester Regular Examination 2017-18

Microprocessor and Its Interfacing

BRANCH: AEIE, EIE, IEE

Time: 3 Hours

Max Marks: 100

Q.CODE: B391

Answer Question No.1 and 2 which are compulsory and any four from the rest.

The figures in the right hand margin indicate marks.

**Q1 Answer the following questions : (2 x 10)**

- a) The memory capacity of 8085 microprocessor is  
64 K (ii) 1MB (iii) 16 MB (iv) 640B
- b) If a microprocessor is capable of addressing 1MB of memory, then its address bus width is (i) 16 bits (ii) 20 bits (iii) 8 bits (iv) None of these
- c) Which kind of stack memory is used in 8085?  
(i) FIFO (ii) FILO (iii) LIFO (iv) LILO
- d) Which interrupt has Highest Priority in 8085 microprocessor?  
(i) INTR (ii) RST 7.5 (iii) TRAP (iv) RST 6.5
- e) In 8085, which of the following modifies the program counter?  
Only PCHL instruction  
Only ADD instructions  
Only JMP and CALL instructions  
All instructions
- f) Which Register Pair of 8085 is not accessible by user?  
BC (ii) DE (iii) WZ (iv) HL
- g) Whenever carry is generated from lower nibble to higher nibble which flag is affected?  
(i) Sign Flag (ii) Parity Flag (iii) Carry Flag (iv) None of these
- h) ALE stand for: (i) Address latch enable (ii) Address line enable  
(iii) Address lower enable (iv) Address last enable
- i) When RESET IN pin is held high, the Program Counter in 8085 is initialized to (i) FFFFH (ii) 00FFH (iii) FF00H (iv) 0000H.
- j) For an 8085 microprocessor having a clock frequency of 5 MHz, the time taken to execute an instruction having 20 T states will be  
(i) 4 $\mu$ s (ii) 0.4 $\mu$ s (iii) 4 ns (iv) 10ms

**Q2 Answer the following questions : (2 x 10)**

- a) What will be the value held in the Flag register after addition of 07H and CFH?
- b) Show using a diagram how the multiplexing of lower order address bus is done in 8085?
- c) What is the use of the 8085 microprocessor pins HLDA and  $\overline{INTA}$  ?
- d) Which instructions are used for Stack operation in 8085?
- e) For 8085 microprocessor it is given that SP=FFFF, DE=8634H, BC=6290H, A= 46H, HL=4500H, PC=8090H. What happens after you execute the instructions: XTHL and XCHG
- f) How many channels are available with 8257 DMAC? What are the two modes in which the 8257 DMAC can be interfaced with 8085 microprocessor?
- g) What are the functions of the following pins of 8051 microcontroller:  $\overline{EA}$  and  $\overline{PSEN}$ ?
- h) From the following code of 8253 Timer determine which counter is selected and its mode of operation.  
3000 MVI A, 12 H  
3002 OUT 83  
3004 MVI A, 10  
3006 OUT 82

- i) Name one 8 bit and one 16 bit register of 8051 Microcontroller.
- j) Which instruction of 8085 allows you know if there are any pending interrupts? The contents of which register is used for this instruction?
- Q3 a)** For the given 8085 program answer the following questions: **(10)**  
 3000 LHL D 6507H  
 3003 DAD H  
 3004 SHLD 6509H  
 3005 HLT  
 Inputs: 6507 – 96 H  
 6508 – 75 H  
 Find the error in the program and rectify it.  
 Considering the rectified program  
 What will be the result and where would it be stored?  
 What is the Addressing Mode of the first instruction?  
 What type of instruction is SHLD?  
 When HLT is executed what will be the content of the program counter?
- b)** Write an assembly language program for 8085 to find the larger of two numbers. **(5)**
- Q4 a)** Draw the timing diagram of the 8085 instruction STA 8040H. **(10)**  
**b)** What are the different Registers available with 8085? Mention their use. **(5)**
- Q5 a)** Design the interfacing of two 8K X 4 bits RAM and two 4K X 8 bits EPROM with 8085 microprocessor. Assume the starting address is 8000H. Show the memory map. **(10)**  
**b)** What do you mean by vectored interrupts? Give examples. Differentiate between hardware and software interrupts. **(5)**
- Q6 a)** What are the different operating modes of 8255? **(10)**  
**b)** Describe the bits of the Control Word Register of 8255. Determine the control word for the following configuration of the ports of Intel 8255 for Mode 1 operation. Port A= input; Port B=output, PC<sub>6</sub> and PC<sub>7</sub> are used as input. **(5)**
- Q7 a)** Discuss with suitable diagrams the memory organization of 8051 microcontroller. **(10)**  
**b)** Write 8051 instruction for the following operations: **(5)**  
 Multiply the contents of Accumulator by Register B  
 Increment Data Pointer Register  
 Add the contents of Register R1 to the to the accumulator with carry  
 Subtract immediately 78H from accumulator with borrow.  
 Increment the content of internal memory location specified by R0.
- Q8 a)** With respect to 8253 Timer Answer the following questions: **(10)**  
 How many counters does it have?  
 How many operating modes does it have?  
 What is the description of D3-D1 bit of its Control Word Register?  
 Which pins/ signals are associated with each Counter?  
 Name two applications of the 8253 timer.
- b)** Write a program to generate a square wave using 8253 using Counter1 operating as a binary counter with count N=32. **(5)**
- Q9 a)** What is the use of the 8251 USART? Discuss the control pins associated with the transmitter and receiver of 8251 USART. **(10)**  
**b)** Illustrate the interfacing of 8251 USART with 8085 microprocessor. **(5)**