S.E. (C.S.E.) (Sem. – III) Examination, 2008
DIGITAL SYSTEMS AND MICROPROCESSORS
(New Course)

Day and Date : Saturday, 29-11-2008
Time : 1.30 p.m. to 3.30 p.m.

Max Marks : 50

Instructions:  i) Attempt any two questions from each Section.
            ii) Figures to right indicate full marks.
            iii) Assume suitable data wherever needed.

SECTION – I

1. a) Explain clocked S-R flip-flop along with its waveforms.  
    b) Simplify the Boolean equations using Boolean Theorems :
       i) \( y = (C + D) + \overline{A} C \overline{D} + A B C + \overline{A} B C D + A C \overline{D} \)
       ii) \( x = (A + B) (A + B + D) \overline{D} \)
       iii) \( w = ABC + ABC + A \)

2. a) Describe asynchronous data transfer with an appropriate example.
    b) Draw the logical diagram of a full adder and explain it.
    c) i) Perform BCD Addition of : 59 + 38
        ii) Perform hex addition of : 67F + 2A4
    d) Give two points of distinction between a microcomputer and a microprocessor.

3. Write short notes on (any three):
   a) Asynchronous Down Counter.
   b) De Morgan’s Law.
   c) Clocked D - Flip - Flop
   d) Logical devices used for interfacing.

P.T.O.
SECTION II

4.  a) Draw and explain Demultiplexing hardware for low order address and data bus of 8085.  
    b) Explain the following instruction and write the contents of flag reg after execution of each instruction 
       i) XRA A 
       ii) MVI B, 44 H 
       iii) DCX H 

    Assuming before each instruction flags are reset and A = 87 H, B = 34 H, 
    HL = CO59 H.

5.  a) Write 8085 assembly language programme to transfer the contents of mem 
     location C200H - C209H to C300 H - C309 H.  
    b) How many memory chips will be required to implement 2K x 8 using 1K x 4 ? 

    Draw and explain circuit to implement the same.

6.  a) Explain hardware and software interrupt.  
    b) Explain execution of CALL and RET instruction with suitable example.
S.E. (CSE) (Semester – III) (New) Examination, 2009
DIGITAL SYSTEMS AND MICROPROCESSORS

Day and Date: Saturday, 16-5-2009
Time: 1.30 p.m. to 3.30 p.m.

Total Marks: 50

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data, wherever needed.

SECTION – 1

1. a) Explain microprocessor architecture with its operations. 7

b) Explain asynchronous upcounter along with its waveform. 6

2. a) Implement logic equations:
   i) \( Z = \overline{W} + \overline{PQ} \)
   ii) \( x = \overline{ABC} (A + D) \) 2

b) Simplify using Boolean Theorems:
   i) \( x = AB(\overline{CD}) + \overline{AB}D + BCD \)
   ii) \( y = (Q + R)(\overline{Q} + \overline{R}) \) 2

c) Explain Clocked J-K Flip-Flop with neat waveforms. 4

d) Explain with block diagram the working of a microcomputer. 4

3. a) Represent addition in 2’s compliment system of
   i) \(-9\) and \(-4\)
   ii) \(+9\) and \(-4\) 2

b) Give the design of a full adder in detail. 4

c) Perform hex addition of 3AF + 23C. 2

d) Explain anyone De Morgan’s law. 4

P.T.O.
SECTION-II

4. a) Explain function of following blocks in 8085 μ P.
   1) Instruction decoder
   2) Register section.
   
   b) Explain following pins of 8085 processor (any 3):
      i) X1, X2
      ii) HOLD
      iii) RESET in
      iv) INTA

5. a) Explain with timing diagram MVIB. 40H instruction.
       
       b) With the help of format, explain use of SIM and RIM instruction related to interrupt structure of 8085 processor.

6. a) Write an assembly language program for 8085 to find largest number out of 10 nos. stored at C200 H onwards.
       
       b) Differentiate between i/o mapped i/o and memory mapped i/o.
S.E. (CSE) (Semester – III) Examination, 2009
DIGITAL SYSTEMS AND MICROPROCESSORS

Day and Date: Friday, 4-12-2009
Time: 1.30 p.m. to 3.30 p.m.

Instructions: 1) Attempt any two questions from each Section.
2) Figures to right indicate full marks.
3) Assume suitable data wherever needed.

SECTION – I

1. a) Explain why NAND and NOR gates are called universal gates. 4

   b) How can an arithmetic overflow be detected when signed numbers are being added? Illustrate with an example. 2

   c) i) Perform Binary Addition.
       011.101 + 010.010
       1001.101
       0.1001

       ii) Perform binary multiplication.
           1001 × 1011
           100101
           1001010

       iii) Subtract in the 2’s complement system +9 and +4.
            100101
            101001
            101010

       iv) Perform binary division.

2. a) What is a shift register? Explain 3-bit shift register with its application. 7

   b) Explain memory addressing and memory mapping. 6

3. Write short notes on (any three): 12

   a) Tristate devices

   b) Data storage and transfer

   c) Microprocessor interfacing

   d) Analog and digital systems.

P.T.O.
SECTION - II

4. a) Explain functions of following pins of 8085 processor (any 3):
   i) IO/WR
   ii) ALE
   iii) Ready
   iv) SID

   b) What is machine cycle? Draw and explain timing diagram of opcode fetch cycle.

5. a) Explain different addressing modes of 8085 with suitable example.
   b) Write a subroutine to generate delay of 10 ms.

6. a) What is vectored and nonvectored interrupt? Explain in detail.
   b) Design memory organisation for 4kx8 using 2kx8 chips.
S.E. (Computer Sci. & Engg.) (Semester – III) Examination, 2010
DIGITAL SYSTEMS & MICROPROCESSORS (New Course)

Day and Date: Saturday, 15-5-2010
Time: 1.30 p.m. to 3.30 p.m.

Total Marks: 50

Instructions: 1) Attempt any 2 questions from each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

1. a) Explain memory classification with the necessary diagram.

b) Explain asynchronous counter with the waveforms.

6

2. a) Describe microcomputer system with an example.

b) Prove the following using De-Morgans Theorem
   i) \( AB + CD = \overline{AB} \cdot \overline{CD} \)
   ii) \( (A + B) \cdot (C + D) = \overline{(A + B)} + \overline{(C + D)} \)

3

2

3. Perform addition in Hexadecimal form
   i) 7F + BA
   ii) 3F + 5C.

2

4. Explain universality of NAND and NOR gate.

3

3. Write short notes on:

a) Peripheral operations
b) Full Adder
c) D-Flip Flop.

(4+4+4)

P.T.O.
SECTION II

4. a) Describe the 8085 architecture.
   b) Write a program in assembly language for memory block transfer from address location 2000 H to 2050 H.

5. a) Define stack. Explain the working of stack.
   b) Explain the flag register of 8085.
   c) What is an interrupt? Explain vectored interrupts in detail.

6. Write short note on:
   a) SIM instruction
   b) Demultiplexing of Address and Data bus
   c) Memory mapped I/O.
S.E. (Computer Science and Engineering) (Semester – III) Examination, 2010
DIGITAL SYSTEMS & MICROPROCESSORS

Day and Date : Monday, 20-12-2010
Time : 10.00 a.m. to 12.00 noon.
Total Marks : 50

Instructions: 1) Attempt any 2 questions from each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

1. a) Explain Tristate devices, buffer and decoder along with their diagrams.  
   b) Explain J-K flip flop and edge triggered J-K flip flop.

2. a) Prove the following using Boolean Algebraic theorems.
   i) \( A + \overline{AB} + \overline{A}B \)
   ii) \( AB + \overline{A}B + \overline{A} \overline{B} = \overline{A} + B = A + B \)
   b) Perform the following operations using 2's complement method:
      i) 48-23
      ii) \(-48-23\).
   c) Perform addition in BCD form:
      i) 55 + 23
      ii) 77 + 13.
   d) Explain any one De-Morgans law.

3. Write short notes on:
   i) Analog and Digital System
   ii) 3 bit shift register
   iii) Memory and Instruction fetch.

   (4+4+4)

P.T.O.
SECTION – II

4. a) Explain 8085 pinout diagram.  
    b) Explain 8085 vectored interrupts.

5. a) Explain different data formats.  
    b) Explain demultiplexing of address and data bus in 8085.  
    c) Explain RIM instruction in detail.  
    d) Explain in detail peripheral I/O instructions.

6. Write short note on:  
    i) Flag Register of 8085  
    ii) Memory read machine cycle  
    iii) Stack  
    iv) Branch operations.
S.E. (Computer Sci. and Engg.) (Semester – III) Examination, 2011
DIGITAL SYSTEMS AND MICROPROCESSORS

Day and Date: Saturday, 14-5-2011
Time: 1.30 p.m. to 3.30 p.m.

Total Marks: 50

Instructions:
1) Attempt any 2 questions from each Section.
2) Figures to the right indicates full marks.
3) Assume suitable data wherever necessary.

SECTION – I

1. a) Name universal gates. Why they are called so? Explain with NAND gate.

b) Implement logic equations with gates.
   - i) \( Z = A + \overline{AB} + A\overline{B} \)
   - ii) \( Z = (Q + R) \left( \overline{Q} + \overline{R} \right) \)

c) Give the design of full adder in detail.

2. a) Describe the working of asynchronous UP-counter.

b) Perform BCD addition: 928 + 280.

c) Subtract Hex numbers: 3 E91 – 2F 93.

d) Explain any one De-Morgans Law.

3. Write short notes. (4+4+4)

   a) Decoder

   b) Data storage and transfer

   c) Clocked D-Flip flop

P.T.O.
SECTION – II

4. a) Explain control and status signals of 8085 microprocessor.

   b) Explain the following instructions with suitable examples.
      i) SBB R
      ii) DAD Rp
      iii) HLT

5. a) Draw and explain timing diagram for following instruction.

      MVI A, 80H.

   b) Explain SIM instruction format.

6. a) Interface 2K×8 memory to 8085 using 1K×4 memory chips. Give address
      range of each chip.

   b) Give difference between memory mapped I/O and I/O mapped I/O.
S.E. (Computer Sci. & Engg.) (Semester – III) Examination, 2011
DIGITAL SYSTEMS AND MICROPROCESORS
Sub. Code: 42685

Day and Date: Friday, 9-12-2011
Time: 10.00 a.m. to 12.00 noon
Total Marks: 50

Instructions: 1) Attempt any 2 questions from each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

1. a) How the microprocessor fetch instruction from memory? Explain with diagram. 6
   b) What is shift register? Explain 4-bit shift register. 7

2. a) What do you mean by
   i) Counter
   ii) Asynchronous counter
   iii) Synchronous counter
   iv) BCD counter. 4
   b) Prove using boolean algebra 4
   i) AB + AC + BC = AB + AC
   ii) (x + y + xy)(x + z) = x + yz
   c) Perform binary addition: 011.101 + 101.011. 2
   d) Perform binary multiplication: 1011×101. 2

P.T.O.
3. Write short notes: (4+4+4)
   a) Buffer
   b) De-Morgans Theorem
   c) Full adder.

SECTION – II

4. a) Draw and explain architecture of 8085. 7
   b) Explain addressing modes of 8085 with example. 6

5. a) Draw and explain timing diagram of 8080 H. 6
   b) Explain the necessity of stack for microprocessor system. 6

6. a) Explain how RIM instruction is used to check pending interrupts. 6
   b) Write an assembly language program to find the smallest number from 10 numbers stored from 0200 H onwards. 6