Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester – III Information Technology
Regular Examination November- December, 2014
2IT302: Computer System Organization

Time: 3 Hours]   [Total Marks: 70

Instructions:

1. Attempt all questions.
2. Figures to the right indicate full marks.
3. Each section should be written in a separate answer book.

SECTION-I

Q-1 A. Convert the base of following numbers. Also show the process of conversion. [6]
    1. $(123.45)_{10} = ($ _____ $)_3$
    2. $(FA32B.A2)_{16} = ($ _____ $)_8$
    3. $(10100100.1011)_2 = ($ _____ $)_{10}$

    B. Express following functions in product of maxterm form. [6]
    1. $F(A,B,C) = A(B+C')$
    2. $F(X,Y,Z) = XY + X'$

OR

Q-1 A. Convert the following number base. Also show the process of conversion. [6]
    1. $(10589.25)_{10} = ($ _____ $)_2$
    2. $(123456.70)_8 = ($ _____ $)_{16}$
    3. $(1100101.0101)_2 = ($ _____ $)_8$

    B. Express following functions in sum of minterm form. [6]
    1. $F(A,B,C) = (A+B)(A'+C)$
    2. $F(X,Y,Z) = XY + XZ'$

Q-2 A. What is importance of parity bit in communication? Design odd parity generator circuit for 3 bit binary message. [5]

    B. What is binary parallel adder? Draw the circuit diagram of 4-bit binary parallel adder. [6]

OR

Q-2 A. Design Octal to Binary encoder circuit. [3]

    B. Draw the circuit diagram for function $F(A,B,C,D) = A'BC + AD + A(B+CD)$. [3]

    C. Implement full adder circuit using suitable decoder and basic gates. [5]

Q-3 A. Do as directed. [6]
    1. Give reflected code of 10110.
    2. Write 2's complement of 10000.
    3. Write excess 3 code of 1010.
    4. Write complement of $(A+B'C)$.
    5. Write dual of $X+0 = X$.
    6. Give 1's complement of 10010.

    B. Minimize the Boolean function $F(A,B,C,D) = \Sigma(0, 2, 4, 6, 8, 10, 12, 14) + d(1,5,13,9)$ using K-map method. [6]

SECTION-II

Q-4 **A.** Design a counter that counts 00 to 11 using D flip-flop. [6]

     B. Simplify function F(W,X,Y,Z) = $\sum$(0,4,5,6,10,12,14,15) using tabular method. [6]

OR

Q-4 **A.** Implement and explain master slave flip-flop in detail. [6]

     B. Design a circuit for following function using multiplexer. [6]

        F(X,Y,Z) = $\sum$(1,2,4,7)

Q-5 **A.** A memory location C202 contains 43 data. Write an ALP to convert this data to 34. Store the modified number to location D250. [5]

     B. Load the accumulator by 65 and get another number from memory location C300. Add these two numbers. If carry is generated then store 01 to register D otherwise store 02 to register D. [6]

OR

Q-5 **A.** A memory location D255 contains DA data. Mask the bits D0, D1, D2 and D5 of the given data and store result to memory location C261. [5]

     B. Subtract two number stored at memory locations C201 and C250. If result of subtraction is zero then store 01 to register H otherwise store 02 to register H. [6]

Q-6 **A.** Answer the followings. [8]
1. How many memory locations can be addressed using 10 bits?
2. How many bits require to access 2048 memory locations?
3. Write two 3-bytes instructions of 8085.
4. What is the size of data bus and address bus of 8085 microprocessor?

     B. Identify addressing modes (Direct or Indirect or Immediate) for following 8085 instructions. [4]

       1. SUB B   3. LDAX B
       2. LDA 2300   4. MVI A,33

END OF PAPER