Reg. No. | | | | | | | | | |

BCACAC 108

Credit Based I Semester B.C.A. Degree Examination, Nov./Dec. 2015
(Common to All Batches)
COMPUTER ORGANIZATION

Time : 3 Hours Max. Marks : 80

Note : *Answer* ***any ten*** *questions from Part – **A** and* ***one full*** *question from* ***each*** *Unit of Part – **B**.*

PART – A **(2×10=20)**

1. a) Find the 1's and 2's complements of the binary number 1010101.
   b) Define byte and nibble.
   c) Write Excess-3 and binary equivalent of $(45)_{10}$.
   d) Draw venn diagram for xy + xz.
   e) Prove that x + x = x.
   f) Write the truth table and logic diagram of XOR gate.
   g) What is meant by duality principle ? Write the dual of the given expression $F = (x + y)\ (x + y')$.
   h) What is combinational logic circuit ? Draw the block diagram.
   i) What is magnitude comparator ?
   j) What is multiplexer ? Why is it called data selector ?
   k) What is flip flop ? Write characteristic table of D-flipflop.
   l) Define characteristic table and excitation table.

P.T.O.

PART – B

Unit – I

2. a) Write a note on ICs. **(4+6+5)**

   b) Perform the following subtraction using 9's and 10's complement method : 8052 – 3250.

   c) State and prove Demorgan's theorems for two variables.

3. a) Perform the following conversion

   i) $(BCD.A1)_{16} = (\ )_{10}$

   ii) $(915.67)_{10} = (\ )_{8}$. **(4+6+5)**

   b) Perform following subtraction using 1's and 2's complement methods : $(100.01)_2 - (101.11)_2$.

   c) Write a note on error detection codes.

Unit – II

4. a) Using K-map, simplify the following expression : **(5+5+5)**

   $F(A, B, C, D) = \Sigma(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$.

   b) Implement the Boolean function $F(A, B, C, D) = A(B + CD) + BC'$ using only NAND gate.

   c) Write the sum of minterm and product of maxterm for given expression.

   $F(X, Y, Z) = XY + X'Z$.

5. a) Minimize $F(A, B, C, D) = \Sigma(0, 3, 4, 7, 8) + \Sigma d(10, 11, 12, 13, 14, 15)$ and draw the logic diagram for minimized expression. **(6+5+4)**

   b) Implement Boolean function $F = x'y'z + x'yz + yz'$ with basic gate and also write the truth table.

   c) Prove that NOR is a universal gate.

Unit – III

6. a) Explain the working of half adder with its logic diagram. (5+5+5)
   b) Explain the working of 3 × 8 decoder.
   c) Explain the working of 4 × 1 multiplexer.

7. a) Design 2 bit magnitude comparator. (5+5+5)
   b) Design BCD to Excess-3 code convertor.
   c) Design octal to binary encoder.

Unit – IV

8. a) What is shift register ? Explain with a neat diagram. (5+5+5)
   b) Design 3-bit counter using JK flipflop.
   c) Explain the working of clocked RS flipflop.

9. a) Explain state table, state diagram and state equation using an example. (5+5+5)
   b) Design a 4-bit ripple counter.
   c) Explain the working of JK flipflop. Write the characteristic table and characteristic equation.