Computer Organisation and Architecture

2008 May

Technology BCA

Semester 2

University Exam

Mangalore University

BCACAC 153

Reg. No.

Credit Based Second Semester B.C.A. Degree Examination

April / May 2008

COMPUTER ORGANISATION AND ARCHITECTURE

Time : 3 Hours Max.Marks: 80

Note: Answer any TEN questions from PART A and answer any one full questions from PART B.

PART-A

(10x2=20)

1. a. Explain ADD instruction.
   b. Write the truth table of XOR gate and draw the logical diagram.
   c. Mention any two scientific application of digital computer.
   d. Draw the circuit diagram of XNOR gate.
   e. Prove x+x=x.
   f. Define excitation table and characteristic table.
   g. Define QUAD and OCTET in Karnaugh's Map.
   h. Draw the diagram of RS flip flop using NOR or NAND gate.
   i. Convert $(1BC)_{16}$ to decimal number.
   j. Define modulus of a counter.
   k. What is a BCD code? Give an example.
   l. List the universal gates and why they are called so?

PART-B

UNIT-I

2. a. Explain the procedure of converting decimal to octal number with example.
   b. Explain the basic components of a digital computer with diagram.
   c. Differentiate between assembly language and high level language. (5+5+5)

OR

3. a. Discuss the application of computer in business.
   b. What is an instruction? Explain MUL instruction.
   c. Convert decimal number 225.225 to binary, octal and hexadecimal number. (6+4+5)

Contd... 2

UNIT-II

4. a. What are NAND and NOR gates? Explain their functionality with logic diagram and truth table.

   b. Simplify the Boolean function.
   $F(x,y,z)= \sum (0,2,4,5,6)$

   c. Implement the following function with NAND gate.
   $F(x,y,z)= \sum (0,6)$ (5+5+5)

OR

5. a. What are minterms and maxterms? Explain with example.

   b. Obtain the simplified expression in
   i) Sum of products
   ii) Product of sums for the expression
   $x'z'+y'z'+yz'+xyz$

   c. State and prove the theorems of Boolean Algebra. (3+6+6)

UNIT-III

6. a. Explain state diagram and state table.

   b. Design mod 6 counter using JK flip-flop.

   c. Explain 2 bit magnitude Comparator. (4+6+5)

OR

7. a. Explain the working of D flip-flop using NAND Gate.

   b. Explain a 4-bit ripple counter.

   c. Design a 3-bit counter using T Flip Flop. (5+5+5)

UNIT-IV

8. a. With a circuit diagram explain the working of a BCD adder.

   b. Explain construction of ALU.

   c. Perform the following arithmetic operation using 1's and 2's operation:
   56-48 (5+5+5)

OR

9. a. Explain 4 bit parallel adder using full adder.

   b. Perform the following arithmetic operation using 9's and 10's Complement form. Verify using ordinary calculation.
   i) 967-532 ii) 899-48

   c. Explain shift operation with a suitable logic diagram. (5+5+5)

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