

SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)

Course & Branch: B.E /B.Tech – CSE/IT

Title of the paper: Digital Computer Fundamentals

Semester: III

Max. Marks: 80

Sub.Code: 11305(2004/2005)/ 12305 (2002/2003/2004/2005)/ 6C0044

Time: 3 Hours

Date: 29-04-2008

Session: AN

PART – A

(10 x 2 = 20)

Answer All the Questions

1. Expand the following (i) ASCII (ii) EBCDIC
2. What is meant by a Positional weighted number system?
3. Draw the logic diagram and truth table for XOR gate.
4. Convert $C + \bar{A}.B$ into minterms.
5. Convert the binary code '1001011' to Gray code.
6. What is meant by a Multiplexer?
7. Distinguish between Synchronous and Asynchronous sequential circuits.
8. Why J-K Flip-Flop is called as Master Flip-Flop?
9. Compare and contrast Static ROM and Dynamic ROM.
10. What is meant by a Virtual Memory?

PART – B
Answer All the Questions

(5 x 12 = 60)

11. (a) Convert the following numbers into Decimal number system using their positional weight.
(i) $1A7_{16}$ (ii) 1427_8 (4)
- (b) Explain the algorithm for subtraction using 10's complement method and also find out the following using the same.
(i) $(72532 - 3250)_{10}$ (ii) $(3250 - 72532)_{10}$ (8)
- (or)
12. With suitable example explain the following in detail:
(a) Error detection code
(b) Reflective codes
13. Simplify the following Boolean function by using the Tabulation Method
 $F(w, x, y, z) = \sum (2, 3, 12, 13, 14, 15)$
(or)
14. (a) State the following laws of Boolean algebra
(i) Distributive Law (ii) Associative Law
(iii) De Morgan's Law (4)
- (b) Reduce the following Boolean expression
 $\overline{A} + AB \overline{C} + \overline{\overline{A} + C}$ (5)
- (c) Realize the following gates in terms of NAND gate
(i) AND (ii) OR (iii) NOT (3)
15. Design a combination circuit that compares two 4-bit numbers, A and B, to check if they are equal. The circuit has one output x, such that $x = 1$ if $A=B$, and $x = 0$ if $A \neq B$.
(or)
16. Design a Combinational logic circuit to perform 4 Bit BCD to Excess-3 code conversion.

17. What is a Flip-Flop? Explain the working principle of D Flip-Flop and T – Flip-Flop in detail.
(or)
18. Explain the operation of BCD Ripple counter with necessary diagrams.
19. Explain in detail about Memory organization and Memory operations.
(or)
20. Explain in detail about the various types of mapping procedures used in Cache memory.