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: 11305/12305 (2002/2003/2004/2005) Time: 3 Hours
Date: 20-04-2007 Session: AN

PART – A (10 x 2 = 20)

Answer ALL the Questions

1. Convert the decimal number 33 into Base 8 & Base 16 number
2. What is meant by an Error Detection code?
3. State De Morgan's theorem.
4. Define Maxterm
5. Realize the Logical AND function using NAND gates
6. What is meant by a Magnitude Comparator?
7. What are Sequential circuits?
8. State any four basic applications of Flip-Flop.
9. Compare and contrast RAM & ROM
10. How many address lines are needed to address a 1024 Bytes memory?

PART – B (5 x 12 = 60)

Answer All the Questions

11. With suitable procedure perform the following conversion

    (i) Convert the following numbers to binary
    a) 0.375 b) 38.21 (4)

    (ii) Convert the following numbers into decimal
    a) $7AB4_{16}$ b) $013B_{16}$ (4)

(iii) Subtract the following decimal numbers using Two's complement Method (a) 35 from 66 (4)

(or)

12. (i) Write short notes on Alphanumeric codes (6)
(ii) With proper example explain the various types of Weighted and Non-weighted codes. (6)

13. (i) Simplify the following expression
a) $\overline{A} + \overline{A}.B + \overline{A.B}$
b) $\overline{A}.\overline{B.C} + \overline{A}.B.\overline{C} + \overline{A.B.C} + A.\overline{B.C}$ (3+3)
(ii) Simplify the following expression using K-Map method

$$Y=\sum(3,4,5,7,9,13,14,15)$$ (6)

(or)

14. Find the minimal Sum Of Product for the following Boolean expression $f(A,B,C,D) = \sum(1,3,4,5,6,7,9,12,13)$ Using the Quine-McClusky method.

15. Design a Combinational logic circuit to perform 4 Bit Binary to Gray code conversion (or)
16. (i) Draw the Logic diagram for 4-To-1 Multiplexer (4)
(ii) Construct an Octal-to-Binary encoder circuit. (8)

17. Draw the J-K Flip-Flop using basic gates and explain it's operation using it's truth table and state diagram.

(or)

18. Design and construct an 3-Bit Binary counter

19. Explain about any Three secondary storage devices.

(or)

20. Explain briefly the classification of Memories and their features.