

SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY
DEEMED UNIVERSITY

Course: B.E./B.Tech.

Title of the paper: Digital Systems

Sub. Code: 24405 (2004)

Semester: IV

Max. Mark: 80

Time: 3 Hours

PART – A

(10 x 2 = 20)

Answer ALL the Questions

1. Convert the binary number 1001.101 to decimal number.
2. What are the advantages of digital systems?
3. Draw the symbol and truth table of NAND gate
4. Simplify the expression: $AB + A \{B+C\} + B \{B+C\}$.
5. Differentiate between sequential logic circuit and combinational logic circuits.
6. Design a half –adder circuit
7. What is the difference between a latch and a flip – flop?
8. What is a shift register give its application
9. Differentiate between volatile and non-volatile memories.
10. What are the different types of ROM?

PART – B

(5 x 12 = 60)

Answer ALL the Questions

11. (a) Express the decimal number -39 as an 8 – bit number in the sign – magnitude, 1's complement and 2's complement form.
(b) What is a digital code? Explain different type of digital codes.

(or)

12. (a) Convert the decimal fraction 19.625 to binary.
(b) Perform the following subtraction of signed number
1. 00001000- 00010011
2. 11100111-00010011
(c) What is BCD code? Perform addition of the BCD numbers 67+53
13. State and prove DeMorgan's theorem. Apply DeMorgan's theorem to the following expression
1. $[(A+B)' + C]'$
2. $[(AB+AC)' + (AB)'C]'$

(or)

14. Simplify the following SOP Expression using K-Map
 $B'C' + AB' + ABC' + AB'CD' + A'B'C'D + AB'CD$
15. Explain a full adder circuit. Draw the circuit of a 4 –bit parallel binary adder.

(or)

16. What is a multiplexer? Explain a 4 to 1 line multiplexer in detail.
17. Explain the operating characteristics of a flip-flop.

(or)

18. Discuss the basic operation of a pulse-triggered master –slave flip-flop.
19. Describe the SRAM storage cell.

(or)

20. Explain how data are read from a ROM.