

B.Sc. Honours Computer Science Major
SEMESTER-II
COURSE 4: DIGITAL LOGIC DESIGN

MODEL QUESTION PAPER

Time : 3 Hours

Max. Marks:70

SECTION – A

Answer any FIVE of the following
(Marks: 5 x 4 marks = 20 marks)

1. Explain how to represent signed binary numbers.
2. Distinguish between weighted and non-weighted codes with example.
3. Draw the logic symbol and write the truth table for:
 - a) AND gate
 - b) OR gate
4. What are minterms and maxterms? Give examples for each.
5. Write about a combinational circuit.
6. What is decoder? Give an example.
7. Write short notes on priority encoder.
8. Differentiate between a latch and a flip flop.

SECTION – B

Answer any FIVE of the following
(Marks: 5 x 10 marks = 50 marks)

UNIT- I

9. (a) Convert the following
- i) $(53.625)_{10}$ to $(?)_2$
 - ii) $(4095)_{10}$ to $(?)_{16}$
 - iii) $(2D7)_{16}$ to $(?)_8$
 - iv) $(777)_8$ to $(?)_2$

Or

- (b) Find the 1's and 2's complements of the following 8-digit binary numbers:
- i) 10101110 ii) 10000001 iii) 10000000 iv) 00000001 v) 00000000

UNIT - II

10. (a) Simplify the following Boolean functions using three-variable K-map.
- a) $F(x,y,z) = \Sigma(0,1,5,7)$
 - b) $F(x,y,z) = \Sigma(0,1,2,3,6,7)$

Or

- (b) Describe the Postulates and Theorems of Boolean Algebra.

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UNIT - III

11. (a) Define Half-Adder. Design a Half-Adder using logic gates.

Or

(b) What is a Full-Adder ? Implement a Full adder using two half adders and one OR gate.

UNIT - IV

12. (a) What is a multiplexer? Implement the Boolean Function: $F(A,B,C)=\Sigma(1,3,5,6)$ with a multiplexer.

Or

(b) Draw the logic diagram of 2:4 Decoder with an ENABLE input using:

- i) NAND gates ii) NOR gates.

UNIT - V

13. (a) Explain the operation of RS flip-flop with a logic diagram.

Or

(b) Explain the operation of JK flip-flop with a logic diagram.

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