

4. Answer the following questions : **(any two)**
10×2=20

- (a) Explain the combinational circuit Decoder with proper diagram and truth table.
- (b) Explain the different logic gate with proper diagram and truth table.
- (c) Explain the Binary and Ripple counter with diagram.
- (d) Explain the R-S flip-flop with state table, state diagram, characteristic table and diagram.

Total number of printed pages-4

44/52 (2) CIT0200204 DGLF

2024

DIGITAL LOGIC FUNDAMENTALS

Paper : CIT0200204

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions : 1×8=8
- (a) Convert $(100101)_2$ to decimal number.
 - (b) Find the 1's complement of 10010101.
 - (c) Find the 2's complement of 0011101.
 - (d) Write the full form of ASCII.
 - (e) What do you mean by combinational circuit?
 - (f) What is the binary addition of 0101001 and 1100010?

(g) Why NAND gate is called universal gate?

(h) Write the full form of RAM and ROM.

2. Answer the following questions : **(any six)**
2×6=12

(a) Convert $(0.513)_{10}$ to octal.

(b) Convert $(673.124)_8$ to binary.

(c) Write the De Morgan theorem.

(d) Define half adder and full adder.

(e) What do you mean by minterm and maxterm?

(f) Draw the truth table for Boolean function : $F = xyz'$

(g) What do you mean by flip-flop?

(h) Draw the logic diagram of boolean function $F = xy'z + xyz' + x'yz$

(i) What is the binary subtraction of 101001 and 010110?

(j) What do you mean by Mealy and Moore machine?

3. Answer the following questions : **(any four)**
5×4=20

(a) Find the complement of Boolean functions

(i) $F_1 = x'yz' + x'y'z$

(ii) $F_2 = x(y'z' + yz)$

(b) Express the Boolean function $F = X + Y'Z$ in sum of minterms.

(c) Simplify the Boolean function

$$F(A,B,C,D) = \sum m(0,2,3,5,7,8,10,11,14,15)$$

using K-map.

(d) Briefly explain the J-K flip-flop with diagram.

(e) Briefly explain the 4×1 multiplexer with diagram and truth table.

(f) Briefly explain the shift-register.

(g) Simplify the Boolean function $F(A,B,C) = \sum(0,1,5,6,7)$ using Boolean laws.

(h) Briefly explain the full subtractor with diagram and truth table.