

Total number of printed pages-3

52 (1) DGLG 1.3 (0)

2021

( Held in 2022 )

## DIGITAL LOGIC

Paper : 1.3

Full Marks : 60

Time : Three hours

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

**Answer any five questions.**

1. (a) Convert  $(10101011.0011)_2$  to decimal number. 2

(b) Convert  $(128)_8$  to Hexadecimal number. 2

(c) What do you mean by Boolean algebra? Draw the truth table for the following Boolean function — 1+4=5

$$F(A, B, C) = A'B + A'B'C + BC$$

Contd.

(d) Simplify the Boolean function — 3

$$F(A, B, C, D) = ABC + A'B'C'D' + CD$$

using k-map.

2. (a) Define Demultiplexer. Implement the full adder using logic diagram.

2+5=7

(b) Briefly explain the  $8 \times 1$  multiplexer with diagram. 5

3. (a) Explain the operation, state diagram and characteristics of D-flip-flop. 7

(b) Define Encoder. Draw a 8-to-3 line encoder using logic gate and truth table. 5

4. (a) Briefly explain the JK Master slave flip-flop and edge triggering. 10

(b) Define programmable logic Array (PLA). 2

5. (a) Draw the logic diagram for the following Boolean expression — 6

$$ABC + A(C + \overline{D}) + C(A + B) + ABCD + \overline{DA}$$

(b) Briefly explain the BCD counter. 6

6. (a) Briefly explain the all logic gates with truth table and logic diagram. 10
- (b) Define static RAM. 2
7. Write short notes on : **(any three)**  $4 \times 3 = 12$
- (a) Johnson counter
- (b) Shift register
- (c) Full subtracter
- (d) Ripple counter.
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