

QUESTION 2007

Group – A

(Multiple Choice Type Question)

1. Choose the correct alternatives for any ten of the following:

i) $x + xy = x$

The above expression follows

a) de Morgan's law

b) Associative law

c) Distributive law

✓ d) Absorption law

ii) $A'B + B'C + C'D$

To simplify the above expression using karnaugh map we need:

a) 2 variable karnaugh map

b) 5 variable karnaugh map

✓ c) 4 variable karnaugh map

d) 3 variable karnaugh map

iii) BCD code of 7652 is

a) 1010 1011 1111 0111

✓ b) 0111 0110 0101 0010

c) 0110 0101 1011 0010

d) 1110 1100 1010 0100

iv) The Boolean $XY + 1$ is

a) 0

✓ b) 1

c) XY

d) $X + Y$

v) In which of the following gate the output is high if and only all inputs are low?

✓ a) NAND

b) OR

c) AND

d) XOR

vi) Flip- Flop outputs are always

✓ a) Complementary

b) Same

c) Independent to each other

d) Same as input

vii) Flip- Flop circuit can be used for

a) Scaling

b) Rectification

c) Modulation

✓ d) Counting

viii) If a flip- flop is in the SET state, its Q output will be

a) 0

✓ b) 1

c) Undetermined

d) None of these

- ix) 4 kB is equivalent to
 a) 4096 bytes b) 32768 bits
 ✓ c) Both (a) and (b) d) None of these
- x) The output of a sequential circuit depends on
 a) Present input only
 ✓ c) Both present and past inputs b) Past input only
 d) Present output only
- xi) Convert $(10110)_2$ to Grey Code
 a) 10111 b) 11010
 c) 10000 ✓ d) 11101
- xii) Simplify $(A + A'B)$
 a) $A' + B$ ✓ b) $A + B$
 c) $A + B'$ d) $A' + B'$

Group- B

(Short Answer Type Questions)

2. State & prove de Morgan's law in Boolean algebra.

See Topic: **BOOLEAN ALGEBRA**, Short Answer Type Question No. 4.

3. a) Convert the following : 1101.1110 to decimal

b) Write the gray code for 100111011.

See Topic: **NUMBER SYSTEM**, Short Answer Type Question No. 5.

4. a) If $(12A)_3 = (123)_A$ then find the value of A.

b) Find the 10's complement of $(935)_{11}$.

See Topic: **NUMBER SYSTEM**, Short Answer Type Question No. 6.

c) ~~Explain distributive law with example in Boolean algebra.~~

5. a) Prove the idempotent law in Boolean algebra.

b) Express $(X+Y+Z)(X+W)$ in its equivalent POS form.

See Topic: **BOOLEAN ALGEBRA**, Short Answer Type Question No. 5.

6. What is flip-flop? Draw a block diagram, truth table of a D flip-flop.

See Topic: **FLIP-FLOP**, Short Answer Type Question No. 3.

Group- C

(Long Answer Type Questions)

7. (a) What is a multiplexer? Realize the following switching function

$$f(A, B, C, D) = \sum m(1, 2, 6, 7, 11, 12, 15)$$

using a 16/1 multiplexer and an 8/1 multiplexer.

(b) Draw the truth table of 1 of 8 decoder and 8 to 3 encoder.

See Topic: **COMBINATIONAL CIRCUIT**, Long Answer Type Question No. 5.

8. a) Distinguish between SR flip-flop and JK flip-flop with their logic diagram and truth table.

b) Convert JK flip-flop to T flip-flop.

c) Explain the functions of shift register with parallel load.

POPULAR PUBLICATIONS

- a) & b) See Topic: FLIP-FLOP, Long Answer Type Question No. 7.
c) See Topic: RESISTER & COUNTER, Long Answer Type Question No. 3.

9. a) With block diagrams explain the operation of RAM & ROM.
b) What are the different types of ROM available?
c) What is SRAM and DRAM?

See Topic: MEMORY DEVICE, Long Answer Type Question No. 1.

10. a) what is shift register? Design a 4 bit shift register using D-Flip- flop.
b) Simplify the expressions:

i) $Y = ABC + AB'C + ABC'$

ii) $Z = a + a'b + a'b'c + a'b'c'd$

- a) See Topic: RESISTER & COUNTER, Long Answer Type Question No. 4.
b) See Topic: BOOLEAN ALGEBRA, Short Answer Type Question No. 6.

11. Write short notes on any three of the following:

- a) Multiplexer
b) Shift register
c) Binary counter
d) Priority checker
e) EBCDIC

- a) See Topic: COMBINATIONAL CIRCUIT, Long Answer Type Question No. 14(b).
b) See Topic: RESISTER & COUNTER, Long Answer Type Question No. 10(a).
c) See Topic: RESISTER & COUNTER, Long Answer Type Question No. 10(d).
d) See Topic: COMBINATIONAL CIRCUIT, Long Answer Type Question No. 14(c).
e) See Topic: CODES, Long Answer Type Question No. 3(b).