

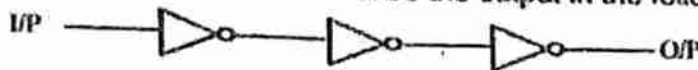
Strikethrough Questions are not included in New Syllabus

QUESTION 2004

1. a) Find 9's complement form of $(63)_{10}$
- b) Subtract $(10101)_2$ from $(11010)_2$ by the 2's complement method.
- c) Find out the equivalent Octal number of $(10111.01)_2$.
- d) Convert 0001 BCD number to XS-3 form.

See Topic: NUMBER SYSTEM, Long Answer Type Question No. 1.

- e) If the input to an inverter is A, what will be the output in the following case:



- f) How will you use 2-input AND gates to make 3-input AND gate.
- g) Sketch a circuit to implement the equation given below

$$X = \overline{AB} + CD$$

- h) The input waveforms of a 2-input EX-OR gate are as follows. Draw the output waveform.



- i) State the logic function being performed by the following equation $\alpha = \overline{A \cdot B}$.
- j) Draw a circuit to perform as a 2-input AND gate using NAND gates.

See Topic: BOOLEAN ALGEBRA, Long Answer Type Question No. 1.

2. a) Design BCD to Excess-3 code converter.

- b) Implement NOT gate with 2-input EX-OR gate.

a) See Topic: COMBINATIONAL CIRCUIT, Long Answer Type Question No. 1.

b) See Topic: LOGIC GATES, Short Answer Type Question No. 1.

3. a) Apply Karnaugh map method to obtain the minimal form for the function:

$$f(A, B, C, D) = \sum(0, 4, 5, 7, 8, 9, 13, 15)$$

$$d(A, B, C, D) = \sum(1, 2, 6, 10)$$

- b) Design a full subtractor circuit using minimum number of 2-input NAND gates. Write down the truth table and Boolean function also.

a) See Topic: KARNAUGH MAP, Short Answer Type Question No. 1.

b) See Topic: ARITHMETIC CIRCUIT, Long Answer Type Question No. 1(a).

4. a) Implement the following function NOR gate: $\overline{A}BCD + \overline{A}BC\overline{D} + \overline{A}B\overline{C}D + \overline{A}B\overline{C}\overline{D}$

- b) Design a NOR gate using NAND gate.

See Topic: BOOLEAN ALGEBRA, Question No. 2.

POPULAR PUBLICATIONS

5. a) Design a counter which can count decimal 3 to 9 by using T-Flip-Flop.
b) Design a Full subtractor by using two half subtractors by clearly mentioning the truth table and equations.
a) See Topic: FLIP-FLOP, Long Answer Type Question No. 1.
b) See Topic: ARITHMETIC CIRCUIT, Long Answer Type Question No. 1(b).
6. a) Draw a circuit of clocked master slave JK Flip-Flop with NAND gates only.
b) Convert a SR Flip-Flop to a D Flip-Flop.
See Topic: FLIP-FLOP, Long Answer Type Question No. 2.
7. a) Design a binary to octal decoder circuit with schematic diagram. Explain the design steps.
b) "A decoder may be called a minterm generator" – comment on the statement.
See Topic: COMBINATIONAL CIRCUIT, Long Answer Type Question No. 2.
8. a) What is the usefulness of excitation table of the Flip-Flop?
b) Design a synchronous counter with T Flip-Flop that goes through states 0, 3, 5, 6, 0, How many T Flip-Flop is required to design the counter?
a) See Topic: FLIP-FLOP, Short Answer Type Question No. 1.
b) See Topic: RESISTER & COUNTER, Long Answer Type Question No. 1.
9. Write short notes on any two of the following:
a) Sequential Circuit
b) PROM
c) Demultiplexer
d) Dynamic RAM
a) See Topic: FLIP-FLOP, Long Answer Type Question No. 14(a).
b) See Topic: MEMORY DEVICE, Long Answer Type Question No. 3(a).
c) See Topic: COMBINATIONAL CIRCUIT, Long Answer Type Question No. 14(a).
d) See Topic: MEMORY DEVICE, Long Answer Type Question No. 3(b).