

Duration : 2 Hours

Q. 1 Attempt any four of the following

16

- List any 4 Boolean laws.
- Convert $(64)_8$ into its equivalent decimal.
- Draw the basic gates using NAND gate.
- Is it possible to use the following gates as inverters? If yes, how?

1. NAND	2. OR	3. NOR	4. AND
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- Find the 2's complements of

i. 26	ii. 55	iii. 01010	iv. 1011
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- Explain DeMorgan's 2nd law
- Find the value of

i. $(10111) + (01010)$	ii. $(88)_{16} + (32)_{16}$
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- Convert the following decimal numbers to its equivalent binary number.

i. 25	ii. 16	iii. 39	iv. 56
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Q. 2 Attempt any four of the following

16

- Explain the half subtractor
- Using K map get the equivalent for Y output of EX-NOR gate.
- What is the simplified Boolean equation for the following logic equation expressed by mini terms and don't care conditions. $Y = F(A, B, C, D) = \sum m(0) + d(10, 11, 12, 13, 14, 15)$
- What is a Demultiplexer?
- Implement a 5 line to 32 line decoder using two 4 line to 16 line decoder.
- Draw EX-NOR gate using basic logic gates and write its truth table.
- Draw the diagram and explain controlled inverter.
- Explain an n:1 multiplexer in detail.

Q. 3 Attempt any four of the following

16

- Draw a J.K flip flop with logic gates and explain.
- Write the characteristics table for S-R flip flop.
- Draw the diagram of a bidirectional shift register.
- Draw a clocked S-R flip flop with Preset and clear.
- What is the use of Master Slave J.K flip flop and draw the diagram using NAND gate.
- Explain the T type flip flop.
- Write the excitation table for D flip flop.
- Draw the diagram of a ring counter and explain.

Q. 4 Attempt any Three of the following

12

- Write the Excess-3 code for the decimal numbers from 0 -12
- Draw the diagram of controlled inverter.
- Design D flip flop using S-R flip flop.
- Draw the Ex-OR and EX-NOR gates and write their truth table.
- Draw the diagram of Adder – Subtractor.
- Draw the diagram of a BCD to seven segment decoder and write its truth table.