



SEAT NO : _____

No. Of Pages : 2

[8]

SARDAR PATEL UNIVERSITY
B.Sc. Examination SEMESTER – III
INFORMATION TECHNOLOGY

US03ECSC01 : Digital Computers Electronics

Date: 30/09/2022, Friday Time: 12:30pm to 02:30pm Total Marks: 70

Q.1 Multiple Choice Questions

[10]

1. The OR gate has two or more input signals. If any input is _____, the output is high.
A. high B. low C. both A and B D. none
2. The NAND gate has two or more input signals. If all inputs are _____, the output is low.
A. low B. high C. both A and B D. none
3. The NOR gate has two or more input signals. If all inputs are _____, the output is high.
A. low B. high C. both A and B D. none
4. A _____ is a combinational circuit that converts binary information from the 2^n coded inputs to a n outputs.
A. Half Adder B. Decoder C. Encoder D. Comparator
5. In Comparator, _____ gate is use for comparing bits in word.
A. XOR B. AND C. NOR D. XNOR
6. _____ is way to simplify the equation.
A. Boolean Algebra B. K-MAP C. BOTH D. NONE
7. Half adder is logic Circuit that adds. _____ Digit at a time.
A. 1 B. 2 C. 3 D. 4
8. Half adder consist of. _____ & _____ Gates
A. XOR, AND B. XOR, OR C. XNOR, AND D. XNOR, OR
9. A register is a group of _____ that work together as a unit.
A. flip-flop B. decoder C. multiplexer D. gates
10. In D flip-flop, when CLK is high then output is _____.
A. high B. low C. invert of input D. same as input

Q.2 Fill up the blank or True/False.

[08]

1. The _____ gate has two or more input signals. All inputs must be high to get a high output.
2. An invert gate is also called a _____ gate.
3. In k-map, pair eliminates _____ variable.
4. In k-map, octets eliminates _____ variable.
5. In half adder xor gate's output is sum. [True / False]
6. In half adder and gate's output is carry. [True / False]
7. Ring counter producing words with 1 high bit, which shifts one position per clock pulse. [True / False]
8. A buffer register is the simplest kind of register; all it does store a digital word. [True / False]

[20]

Q.3 Answer the following questions in short (Any 10):

1. Write truth table for : $A'B+B'C$, $ABC+A'B'C'$.
2. Draw the circuit for $A'B+B'C+AC'$.
3. Draw the circuit for $(A \oplus B)'(BC)(A \oplus C)$.
4. Explain sum of product(SOP).
5. Explain sum of product of sum(POS).
6. Describe Quad in k-map with example.
7. What is Multiplexer?
8. Explain 4x1 multiplexer in detail.
9. Explain full adder in detail.
10. Draw logic diagram of D flip-flop.
11. Draw graphical symbol of D flip-flop.
12. Draw logic circuit of ring counters.

[32]

Q.4 Answer the following questions in LONG (Any 4):

1. Explain Associative law, distributive law and commutative law.
2. Explain De'morgan first and second theorem.
3. Define encoder. Explain 8x3 encoder in detail.
4. Define decoder. Explain 3x8 decoder in detail.
5. Explain binary adder-subtractor 1's Complement adder-subtractor in detail.
6. Explain 8x1 multiplexer in detail.
7. Explain shift left register
8. Explain controlled buffer register.

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