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SARDAR PATEL UNIVERSITY

M. Sc. IT (Integrated) SEM – II Examination

Subject: - Digital Electronics

Course: PS02EIIT01 Max. Marks : 70

Date: 2/05/2015 Time: 2:30 pm to 4:30 pm

Q.1 Select best option from the following multiple choice questions. [10]

1. A combinational circuit that performs the arithmetic addition of two bits is called _____.
   (a) Half Adder (b) Full Adder
   (c) Binary Adder (d) Decoder
2. Half adder consists of _____ and _____ Gates.
   (a) XNOR, AND (b) XNOR, OR
   (c) XOR, AND (d) XOR, OR
3. A _____ is a combinational circuit that converts binary information from the n coded inputs to a maximum of 2^n unique outputs.
   (a) Half Adder (b) Encoder
   (c) Decoder (d) Comparator
4. A 8 – to – 1 line multiplexer requires _____ data select line.
   (a) 1 (b) 2
   (c) 3 (d) 4
5. Which of the following device has many input and one output?
   (a) Flip-flop (b) Multiplexer
   (c) De-multiplexer (d) Counter
6. A Comparator compares how many words?
   (a) 1 (b) 2
   (c) 3 (d) 4
7. In K-Map, Quad eliminates _____ variable.
   (a) 2 (b) 4
   (c) 8 (d) 16
8. Don't care conditions are marked as _____ in the output column of the function table.
   (a) 0 (b) 1
   (c) X (d) None of these
9. The basic storage element in a digital system is _____.
   (a) Flip-flop (b) Multiplexer
   (c) Encoder (d) Counter
10. Which of the following is Universal Flip-flop?
    (a) J-K Flip-flop (b) R-S Flip-flop
    (c) D Flip-flop (d) Master-Slave Flip-flop

Q. 2 Write Short Answer Questions: Attempt any Ten [20]

1. Explain De-Morgan First Theorem.
2. Explain Binary Adder.
3. Explain Binary Subtractor.
4. Draw the circuit diagram of Nibble Multiplexer.
5. Draw the circuit diagram of 1 X 4 Line De-Multiplexer.
6. Draw the circuit diagram of Comparator.
7. What is K-Map?
8. Explain Sum of Product (SOP).
9. Explain Pair with example.
10. Explain Shift Left with example.
11. Explain Shift Right with example.
12. Draw the circuit of D Flip Flop.

Q.3 A. Explain Half Adder in detail. [5]

B. Explain 3 X 8 Line Decoder in detail. [5]

OR

Q.3 A. Explain Full Adder in detail. [5]

B. Explain 8 X 3 Line Encoder in detail. [5]

Q.4 What is Decoder? Explain Seven Segment Decoder in detail. [10]

OR

Q.4 What is Multiplexer? Explain 8 X 1 Line Multiplexer in detail. [10]

Q.5 A Explain Quad and Octet in K-Map with example. [4]

B. Simplify the following Boolean Function using K-Map.

$F(A, B, C, D) = \sum (1, 2, 5, 6, 8, 12, 14)$ [6]

OR

Q.5 A. Explain Don't Care Condition in detail. [4]

B. Simplify the following Boolean Function using K-Map.

$F(A, B, C, D) = \sum (1, 3, 5, 6, 8, 11, 15)$ [6]

Q.6 A. Explain RS Flip Flop in detail. [5]

B. Explain Ring Counter in detail. [5]

OR

Q.6 A. Explain JK Flip Flop in detail. [5]

B. Explain Control Buffer Register in detail. [5]

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