

Roll No:

Name:

Mechi Multiple Campus
BCA First Semester
CACS105 Digital Logic
Pre-Board Examination 2075 Time 20: Min



Group- "A"

Attempt all the questions

[10 X 1=10]

Circle (○) the correct answer in the following questions.

- 1. Which of the followings is most widely used alphanumeric code for computer input and output?**
 - a. Grey
 - b. ASCII
 - c. Parity
 - d. BCD
- 2. What is the minimum number of two input NAND gates used to perform the function of two inputs OR gate?**
 - a. One
 - b. Two
 - c. Three
 - d. Four
- 3. Odd parity of word can be conveniently tested by**
 - a. OR gate
 - b. XOR gate
 - c. AND gate
 - d. XNOR gate
- 4. The exclusive NOR gate is equivalent to which gate followed by an inverter?**
 - a. OR
 - b. NAND
 - c. XOR
 - d. AND
- 5. The number of Half and Full adders required to add 16 bit numbers is**
 - a. 8 half adders, 8 full adders
 - b. 16 half adders, 0 full adders
 - c. 1 half adder, 15 full adders
 - d. None of the above
- 6. Which digital system translates the coded information into more intelligent form?**
 - a. Decoder
 - b. Encoder
 - c. Multiplexer
 - d. Demultiplexer
- 7. A DEMUX is used to:**
 - a. Route the data from single input to one of many several outputs.
 - b. Perform serial to parallel conversion.
 - c. Select data from several inputs and route to a single output.
 - d. Both A & B.
- 8. On a master-slave flip flop, when is the master enabled?**
 - a. When the gate is low
 - b. When the gate is high
 - c. Neither of the above
 - d. Both A & B.
- 9. What is one disadvantage of SR flip flop?**
 - a. It has no enable input.
 - b. It has an invalid state.
 - c. It has no clock input.
 - d. It has only a single output.
- 10. 3428 is the decimal value for which of the following binary coded decimal (BCD) groupings?**
 - a. 011010010000010
 - b. 110100001101010
 - c. 110100010010000
 - d. 11010000101000



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Pre-Board Examination 2075 PM: 24 FM: 60 Time 2.40: Hrs

Candidates are required to answer all the questions in their own words as far as practicable.

Group-“B”

Attempt any SIX questions.

[6 X 5 = 30]

1. Perform as indicated: [5]

a) $(3250)_{10} - (72532)_{10}$ using 10's complement method.

b) $(11011)_G = (?)_2$

c) $(10101)_2 - (10001)_2$ using 2's complement method.

2. Why NAND and NOR gates are called Universal gates? Show that all basic gates can be realized.

[1+4]

3. Solve using K-Map and write in SOP and POS form: [5]

$$F(w, x, y, z) = \sum(1, 3, 7, 11, 15) \text{ and } d(w, x, y, z) = \sum(0, 2, 5)$$

4. Differentiate between combinational logic circuit and sequential logic circuit. Also show how two half adders constitute a full adder? [3+2]

5. Design a circuit that produces the square of three bit number using ROM.

6. List the applications of Decoder. Implement 4*16 decoder using 2*4 decoder and explain its operation.

[1+4]

7. Explain Serial-In-Serial-Out (SISO) register with a circuit diagram and timing diagram. [1+4]

Group – “C”

Attempt any TWO questions.

[2 X 10 = 20]

1. a) What does DEMUX do? Construct and explain 8 to 1 MUX using 4 to 1 MUX. [1+4]

b) Implement the given Boolean function using 4X1 MUX: $F(A, B, C) = (1, 3, 5, 6)$ [5]

2. a) Illustrate the operation of JK flip flop showing logic diagram, characteristics table, excitation table and state diagram. [5]

b) Differentiate between latch and flip flop. Illustrate the operation of SR flip flop showing logic diagram, Characteristics table and excitation table. [1+4]

3. a) Distinguish between asynchronous and synchronous counter. Explain the operation of BCD ripple counter with circuit diagram and state diagram. [2+3]

b) Explain the operation of 4 bit synchronous down counter showing circuit diagram, operation table and timing diagram. [5]

~~~Best of Luck~~~