

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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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. What is digital waveform meant for? Distinguish between analog signals and digital signals giving examples. **[1+4]**
2. Perform as indicated: **[5]**
 - a) $(3250)_{10} - (72532)_{10}$ using 10's complement method.
 - b) $(11011)_G = (?)_2$
 - c) $(1010)_2 - (1000)_2$ using 2's complement method.
3. Why NAND and NOR gates are called Universal gates? Show that all basic gates can be realized. **[1+4]**
4. Define standard forms. Express the Boolean function $F = xy + \bar{x}z$ in a product of maxterm form. **[1+4]**
5. Solve using K-Map and write in SOP and POS form: **[5]**
$$F(w, x, y, z) = \sum(1, 3, 7, 11, 15) \text{ and } d(w, x, y, z) = \sum(0, 2, 5)$$
6. Differentiate between combinational logic circuit and sequential logic circuit. Also show how two half adders constitute a full adder? **[3+2]**
7. List the applications of Decoder. Explain the operation of Decimal-to-BCD encoder with truth table and circuit diagram. **[1+4]**

Group – “C”

Attempt any TWO questions.

[2 X 10 = 20]

1. a) What does DEMUX do? Construct 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 conversion of flip flop from SR to JK. **[1+4]**
3. What are registers? Explain the working principle of *Serial in Serial out* (SISO) shift register and *Parallel in Serial out* (PISO) shift register separately with circuit diagram and timing diagram. **[1+4.5+4.5]**.

~~~Best of Luck~~~