

**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



### Mechi Multiple Campus

BCA First Semester

CACS105-Digital Logic

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]  
 $F(w, x, y, z) = \sum(1, 3, 7, 11, 15)$  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~~~