Roll No:

Name:

***BCA First Semester***

***CACS105 Digital Logic***

***Pre-Board Examination* 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

1. **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

1. **Odd parity of word can be conveniently tested by**
   1. OR gate
   2. XOR gate

c. AND gate

d. XNOR gate

1. **The exclusive NOR gate is equivalent to which gate followed by an inverter?**
2. OR
3. NAND
4. XOR
5. AND
6. **The number of Half and Full adders required to add 16 bit numbers is**
7. 8 half adders, 8 full adders
8. 16 half adders, 0 full adders
9. 1 half adder, 15 full adders
10. None of the above
11. **Which digital system translates the coded information into more intelligent form?**
12. Decoder
13. Encoder
14. Multiplexer
15. Demultiplexer
16. **A DEMUX is used to:**
    1. Route the data from single input to one of many several outputs.
    2. Perform serial to parallel conversion.
    3. Select data from several inputs and route to a single output.
    4. Both A & B.
17. **On a master-slave flip flop, when is the master enabled?**
    1. When the gate is low
    2. When the gate is high
    3. Neither of the above
    4. Both A & B.
18. **What is one disadvantage of SR flip flop?**
    1. It has no enable input.
    2. It has an invalid state.
    3. It has no clock input.
    4. It has only a single output.
19. **3428 is the decimal value for which of the following binary coded decimal (BCD) groupings?**

a. 011010010000010

b. 110100001101010

c.110100010010000

d.11010000101000

***BCA First Semester***

***CACS105-Digital Logic***

***Pre-Board Examination*  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]**
2. (3250)10-(72532)10 using 10’s complement method.
3. (11011)G  = (?)2
4. (10101)2-(10001)2 using 2’s complement method.
5. Why NAND and NOR gates are called Universal gates? Show that all basic gates can be realized using NAND and NOR gates. **[1+4]**
6. Solve using K-Map and write in SOP and POS form: **[5]**

F(w, x, y, z)=

1. Differentiate between combinational logic circuit and sequential logic circuit. Also show how two half adders constitute a full adder? **[3+2]**
2. Design a circuit that produces the square of three bit number using ROM.
3. List the applications of Decoder. Show the implementation of 4\*16 decoder using 2\*4 decoder and explain its operation. **[1+4]**
4. 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 4**X**1 MUX: F (A, B, C) = (1, 3, 5, 6) **[5]**

1. 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]**

1. 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~~~***