

**Name: Roll. no:   
Subject: DL   
Level: 1st Semester**

**SET : A**

Mitrapark, Chabahil, Kathmandu

Tel: +977 1 4479017

**Department of Humanities &social Science**

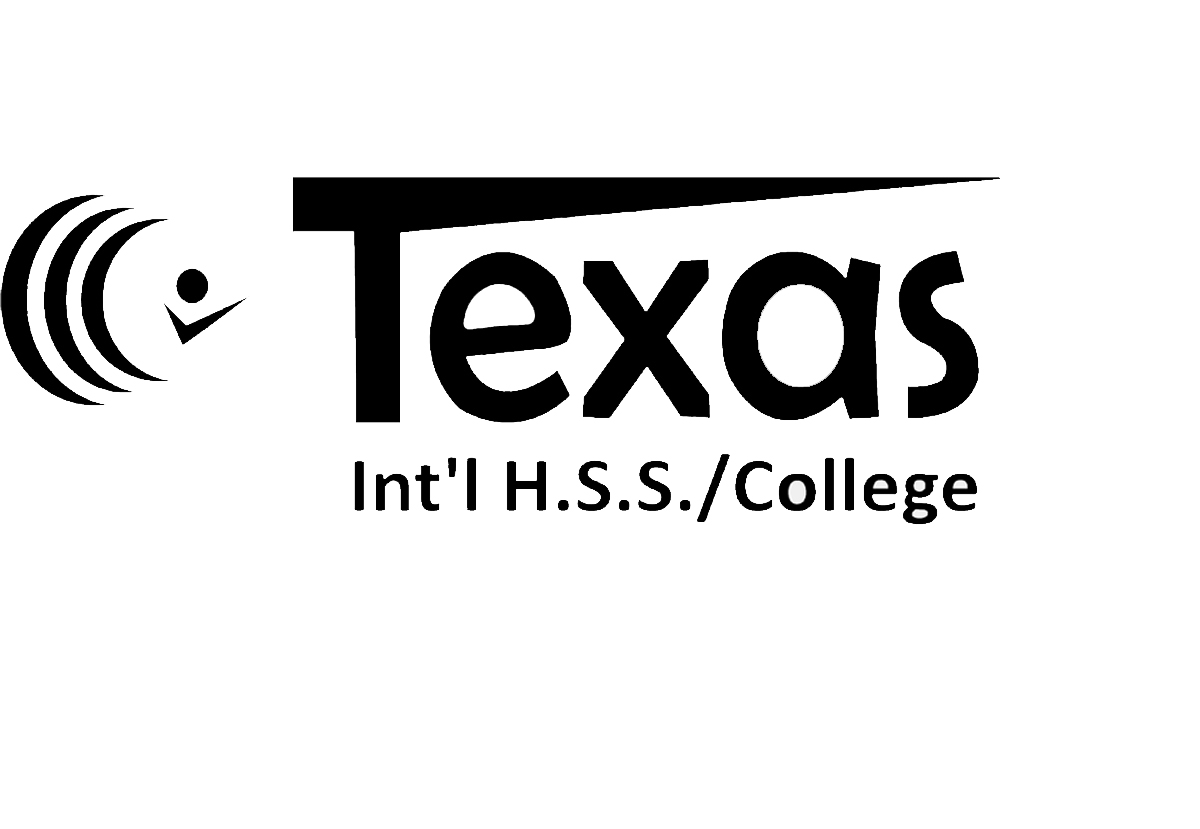
**PRE BOARD - EXAMINATION-2075**

**Group A**

**Attempt all the questions. [10×1=10]**

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

1. The gray equivalent of gray 1111 is
2. 1010 b) 0010 c) 1000 d) 0000
3. If enable input is high then the multiplexer is  
   a) Enable b) Disable c) Saturation d) None of the Mentioned
4. How many inputs will a decimal-to-BCD encoder have?  
   a) 4 b) 8 c) 10 d) 16
5. Code is a symbolic representation of  
   a) Continuous information b) Discrete information  
   c) Decimal information into binary d) Binary information into decimal
6. Which combinational circuit is renowned for selecting a single input from multiple inputs & directing the binary information to output line?  
   a) Data Selector b) Data distributor  
   c) Both data selector and data distributor d) None of the Mentioned
7. How many NOT gates are required for the construction of a 4-to-1 multiplexer?  
   a) 3 b) 4 c) 2 d) 5
8. How many OR gates are required for a Decimal-to-bcd encoder?  
   a) 2 b) 10 c) 3 d) 4
9. Latch is a device with  
   a) One stable state b) Two stable state c) Three stable state d) None of the Mentioned
10. Ripple counters are also called  
    a) SSI counters b) Asynchronous counters c) Synchronous counters d) VLSI counters
11. The truth table for an S-R flip-flop has how many VALID entries?  
    a) 1 b) 2 c) 3 d) 4



**Stream: BCA FM : 60  
Subject: DL PM : 30  
Level: 1st Semester Time: 3 Hrs**

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**Group-B**

**Attempt any SIX questions (6\*5=30)**

1. If A = (35)10 and B = (95)10 , then calculate (A-B) and (-A-B) using 2’s and 1’s complement method
2. Design 8\*1 mux using 4\*1 mux only.
3. What is digital system? Write down advantages and disadvantages of digital system
4. Define Full adder? Also derive necessary outputs for full adder with help of suitable diagram
5. Differentiate between Mealy and Moore sequential machine model with help of diagram
6. Define flip flop. Also explain J-K flip flop with its logical diagram , characteristic table, excitation table and wave form
7. You are provided with a bit sequence of 10010 to operate with serial in and serial out register. Describe the store and retrieve process with supportive diagram and timing diagram.

**Group-C**

**Attempt any TWO questions (2\*10=20)**

1. Implement Boolean function F= using
2. Decoder
3. MUX
4. PLA
5. Design MOD-12 counter using D flip flop. Also differentiate between asynchronous and synchronous counter.
6. Design a combinational circuit with three inputs (X, Y, Z) and three outputs (A, B, C).

* When the triple (X,Y,Z) is taken as the 3-bit representation of a binary number, then (0,0,0) corresponds to 0, (0,0,1) to 1, (0,1,1) to 3, (1,0,1) to 5 and so on.
* Hence, X is the most significant bit while Z is the least significant bit.
* Similarly for the triple (A,B,C). When the binary input (X, Y, Z) is 0, 1, 2 or 3, the binary output is one greater than the input.
* When the binary input is 4, 5, 6 or 7, the binary output is one less than the input.
* Write the Truth Table for the inputs and outputs.
* Simplify the resulting expressions for A, B and C outputs (use algebra or maps).