

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

**SET : B**

Mitrapark, Chabahil, Kathmandu

Tel: +977 1 4479017

**Department of Humanities &social Science**

**PRE BOARD - EXAMINATION-2075**

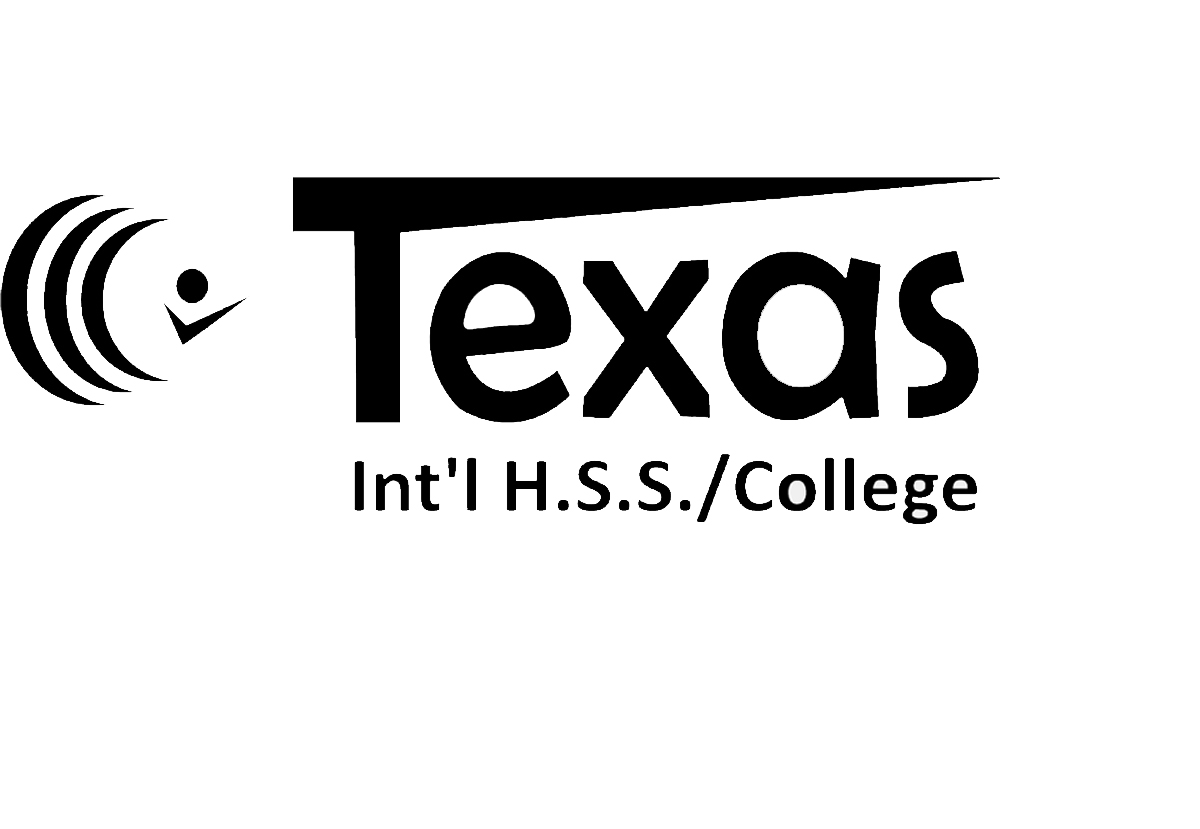
**Group-A**

**Circle (O) the correct answer. (10\*1=10)**

1. The binary equivalent of gray 1111 is
2. 1010 b) 0010 c) 1111 d) 0000
3. Complement of the expression A’B + CD’ is  
   a) (A’ + B)(C’ + D) b) (A + B’)(C’ + D) c) (A’ + B)(C’ + D) d) (A + B’)(C + D’)
4. Half-adders have a major limitation in that they cannot  
   a) Accept a carry bit from a present stage b) Accept a carry bit from a next stage  
   c) Accept a carry bit from a previous stage d) None of the Mentioned
5. How many AND, OR and EXOR gates are required for the configuration of full adder  
   a) 1, 2, 2 b) 2, 1, 2 c) 3, 1, 2 d) 4, 0, 1
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

1. How many NOT gates are required for the construction of a 4-to-1 multiplexer?  
   a) 3 b) 4 c) 2 d) 5
2. How many OR gates are required for a Decimal-to-bcd encoder?  
   a) 2 b) 10 c) 3 d) 4
3. Can an encoder be called as multiplexer?  
   a) No b) Yes c) Sometimes d) Never
4. Ripple counters are also called  
   a) SSI counters b) Asynchronous counters  
   c) Synchronous counters d) VLSI counters
5. What is the preset condition for a ring shift counter?  
   a) All FFs set to 1 b) All FFs cleared to 0  
   c) A single 0, the rest 1 d) A single 1, the rest 0



**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 = (15)10 and B = (35)10 , then calculate (A-B) and (-A-B) using 2’s and 1’s complement method
2. Design 5\*32 decoder using 4\*16 decoder 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 S-R flip flop with its logical diagram , characteristic table, excitation table and wave form
7. You are provided with a bit sequence of 1001 to operate with serial in and parallel out register. Describe the store and retrieve process with supportive diagram and timing diagram.

**Group-C**

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

1. 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).

1. Design decade counter using D flip flop. Also differentiate between asynchronous and synchronous counter.
2. Implement Boolean function F= using
3. Decoder b) MUX c) PLA