International Islamic University Chittagong
Department of Electrical and Electronic Engineering

Final Assessment of Autumn-2020
Course Code: **EEE-2407**
Time: **5 hours** (Writing- **4 hours 30 minutes** + **30 minutes** submission time)

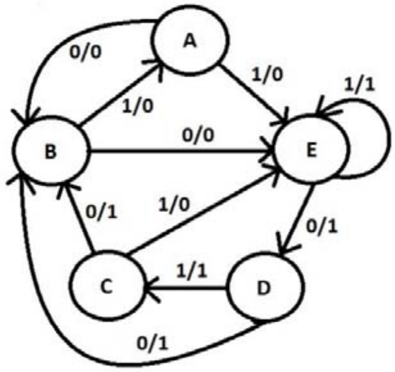
Program: B.Sc. Engg. (EEE)
Course Title: **Digital Electronics**
Full Marks: **50** (**Written** 30 + **Viva/Viva-Quiz**-20)

[Answer **each of the** questions from the followings; Figures in the right margin indicate full marks. **Answer script must be submitted through online method within 5 hours from starting time.]**

1(a).	Draw the logic diagram of a look-ahead carry generator for a 3-bit full adder.	**CO4**	**C**	**02**
1(b).	Design a 3-bit Encoder and find its truth table. How can you transform an Encoder into a Multiplexer?	**CO3**	**U**	**02**
1(c).	Design the following function with a 5x32 decoder IC: F(A,B,C,D,E) = ∑ (X, Y, 12, 15, 19, 24, 27, 30, 31) [Take X and Y from last two digit of your ID, e.g. ET1830XY. If X=Y, take only one]	**CO4**	**Ap**	**02**
2(a).	Implement the following boolean function with multiplexer: F(A,B,C,D) = ∑ (X,Y,6,7,9,11,14,15), take C as input line. [Take X and Y from last two digit of your ID, e.g. ET1830XY. If X=Y, take only one]	**CO4**	**Ap**	**03**
2(b).	Construct a BCD to Excess-3 code converter using: i) Binary parallel adder IC ii) Decoder	**CO4**	**C**	**02**
2(c).	Draw the logic diagram of all basic flip-flops using only NAND gates.	**CO3**	**C**	**01**
3(a).	Design the logic diagram of the sequential circuit that corresponds with the following state table	**CO5**	**C**	**04**

Present state	Input	Next state	Output
A B C	x	A B C	y
0 0 0	0	0 0 1	0
0 0 0	1	1 1 1	1
0 0 1	0	1 1 0	0
0 0 1	1	1 1 1	0
0 1 1	0	0 0 0	0
0 1 1	1	0 1 1	1
1 1 0	0	0 0 0	1
1 1 0	1	0 1 1	0
1 1 1	0	1 1 0	0
1 1 1	1	0 0 1	1

3(b).	Derive the state table from the following state diagram.	**CO5**	**An**	**02**



4(a).	Construct a 3-bit parallel in-serial out shift register. Explain how it works.	**CO5**	**C**	**03**
4(b).	Assume you need to store 16-bit of data in a register. How many clock pulse you will need to load the data and to read the date if the register is a: (i) Serial in-serial out register (ii) Serial in-parallel out register (iii) Parallel in-serial out register (iv) Parallel in-parallel out register	**CO5**	**An**	**01**
4(c).	Draw the sequence table of a 7-bit Ring counter and its logic diagram. Explain how this counter works.	**CO5**	**C**	**02**
5(a).	Design a 7-bit Asynchronous up counter that can count from 0-XY, where X and Y are last two digits of your ID, e.g. ET1830XY.	**CO5**	**C**	**03**
5(b).	Design a synchronous BCD counter.	**CO5**	**An**	**02**
5(c).	What is MOD number? How to find the frequency of the output signal of the last flip-flop for an asynchronous counter?	**CO3**	**R**	**01**
6.	Viva/Viva-Quiz: The time of viva/viva-quiz will be declared in google classroom.			**20**

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