SRM Institute of Science and Technology
College of Engineering and Technology

SET A

DEPARTMENT OF ECE

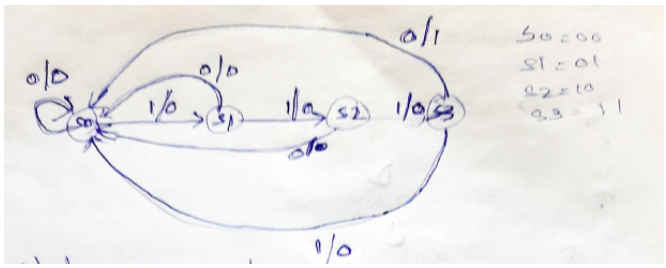
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

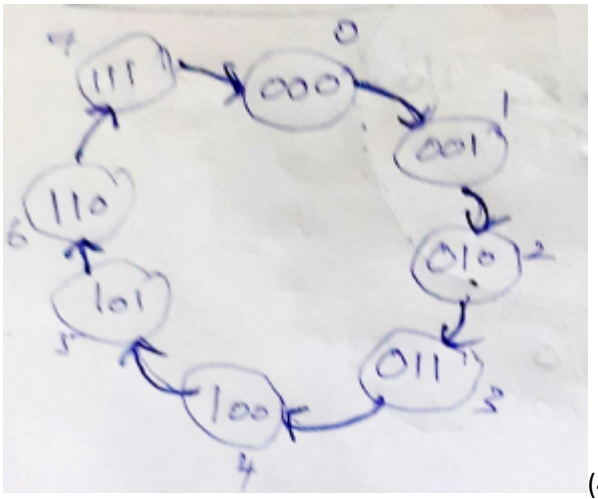
Academic Year: 2021-2022 (EVEN)

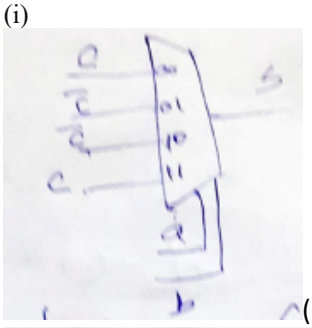
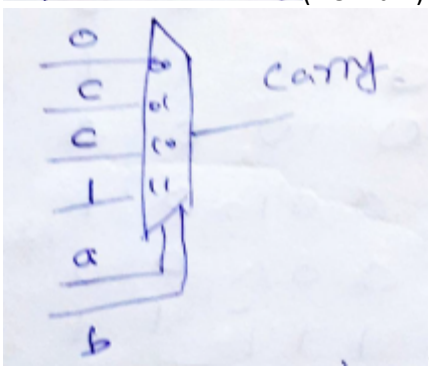
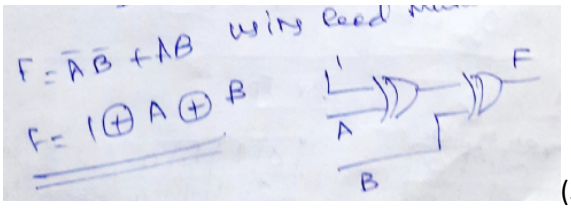
Answer Key

Test: CLAT-1 **Date: 08.04.2022**
Course Code & Title: 18ECE206J Advanced Digital System Design **Duration:** 60 Minutes
Year & Sem: II & IV **Max. Marks:** 25

Part - A
(5 x 1 = 5 Marks)
Answer all

Q. No	Question	Marks	BL	CO	PO	PI Code
1	For Minimizing Multiple Output Logic Circuits, to use (a) Shannon's theorem **(b) K-Map** (c) Consensus theorem (d) Reed Muller Expansion	1	1	1	1,3	1.1.1 3.1.1
2	How many states and flip flops required for Moore model of the given sequence "101011"? (a) 6,3 (b) **7,3** (c) 7,7 (d) 6,6	1	2	1	1,3	1.1.1 3.1.1
3	Which among the following constraint/s is/are involved in a state-machine description? (a) State variable & clock (b) State transitions & output specifications (c) Reset condition (d) **a,b and c**	1	1	1	1,3	1.1.1 3.1.1
4	The elements used in the State diagram are **(a) Transition** (b) Condition (c) Iteration (d) Optional	1	1	1	1,3	1.1.1 3.1.1
5	One of the Reed muller rule A+B=? (a) A⊕ B⊕AB (b) A'⊕ B⊕AB (c) A⊕ A'B **(d) Both (a) and (c)**	1	2	1	1,3	1.1.1 3.1.1
	Part – B (2 x 10 = 20 Marks) **Answer any two**					
6	 **(4 mark)**	10	3	1	1,3	1.1.1 3.1.1

	State table: Present state Q_A Q_B i/p x — Next state Q_A^+ Q_B^+ — o/p y — Flip-flop D_A D_B 0 0 0 — 0 0 — 0 — 0 0 0 0 1 — 0 1 — 0 — 0 1 0 1 0 — 0 0 — 0 — 0 0 0 1 1 — 1 0 — 0 — 1 0 1 0 0 — 0 0 — 0 — 0 0 1 0 1 — 1 1 — 0 — 1 1 1 1 0 — 0 0 — 1 — 0 0 1 1 1 — 0 0 — 0 — 0 0 **(3 mark)** $D_A = \bar{Q}_A Q_B x + Q_A \bar{Q}_B \bar{x}$ $D_B = \bar{Q}_B x$ $y = Q_A Q_B \bar{x}$ (3 mark)					
7	 (4 mark) State table:- Present state Q_A Q_B Q_C — Next state Q_A^+ Q_B^+ Q_C^+ — Flip-flop T_A T_B T_C 0 0 0 — 0 0 1 — 0 0 1 0 0 1 — 0 1 0 — 0 1 1 0 1 0 — 0 1 1 — 0 0 1 0 1 1 — 1 0 0 — 1 1 1 1 0 0 — 1 0 1 — 0 0 1 1 0 1 — 1 1 0 — 0 1 1 1 1 0 — 1 1 1 — 0 0 1 1 1 1 — 0 0 0 — 1 1 1 (4 mark)	**10**	**3**	**1**	**1,3**	**1.1.1** **3.1.1**

	Final Equation $T_A=Q_B\ Q_C$ **$T_B=$ Q_C and $T_C=1$ (2 Mark)**					
8	(i)  (2.5 mark)  (2.5 mark) (ii) Reed muller theorem (2 mark)  (3 mark)	**5** **5**	**2**	**1**	**1,3**	**1.1.1** **3.1.1**

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SET B

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Answer Key

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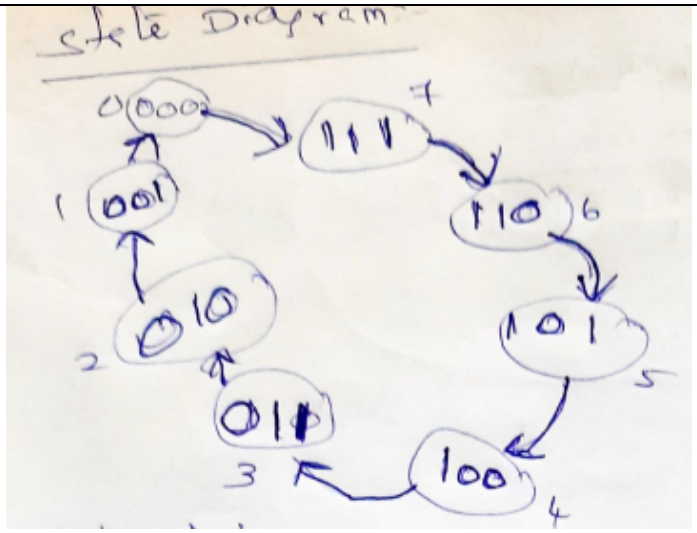
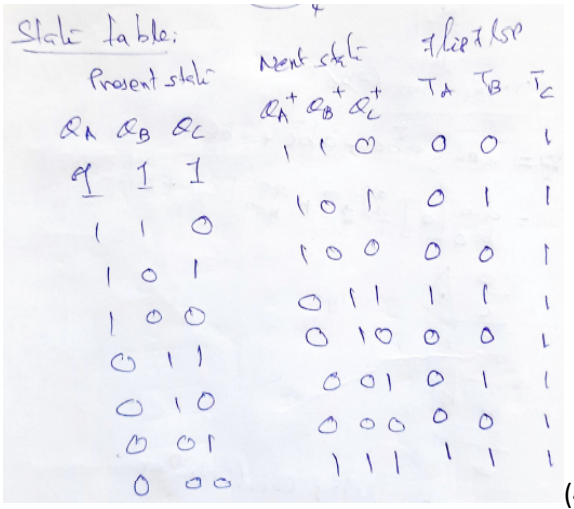
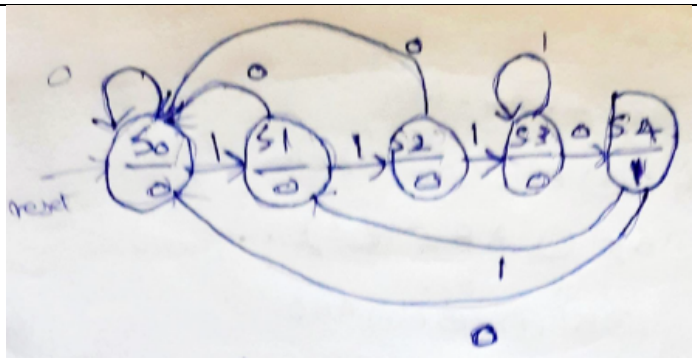
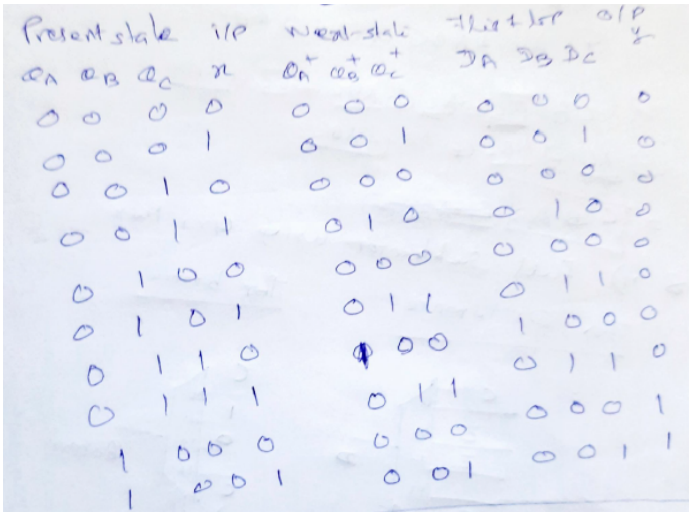
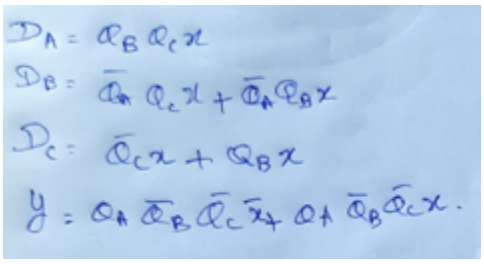
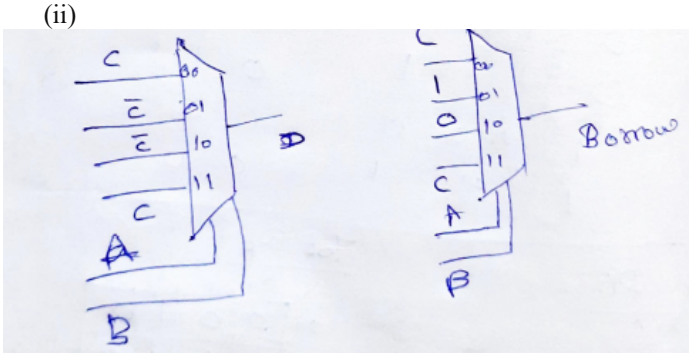
Year & Sem: II & IV | **Max. Marks:** 25

Part - A
(5 x 1 = 5 Marks)
Answer all

Q. No	Question	Marks	BL	CO	PO	PI Code
1	Which theorem is used for eliminating the complement term? (a) Shannon's **(b) Reed Muller** (c) Consensus (d) De Margon's	1	1	1	1,3	1.1.1 3.1.1
2	How many states and flip flop required for Mealey model of the given sequence "10011" **(a) 5,3** (b) 5,5 (c) 6,3 (d) 6,5	1	2	1	1,3	1.1.1 3.1.1
3	A 2 to 1 MUX can be used to realize which of the following (a) only AND,NOT (b) only OR (c) only NOT **(d) AND,OR ,NOT**	1	1	1	1,3	1.1.1 3.1.1
4	In a sequence detector, if the required bit is at its input while checking the sequence bit by bit, the detector moves to _____ (a) Previous state **(b) Next state** (c) Remains in the same state (present state) (d) Null state	1	1	1	1,3	1.1.1 3.1.1
5	A⊕ B⊕BA ⊕B⊕=? **(a) A⊕ AB** (b) A (c) A⊕ B (d) B	1	2	1	1,3	1.1.1 3.1.1

Part – B (2 x 10 = 20 Marks)
Instructions: Answer any two

7	 (4 mark)  (4 mark) **Final Equation T_A=Q_B, Q_C** **T_B= Q_C, and T_C=1** **(2 Mark)**	**10**	**3**	**1**	**1,3**	**1.1.1** **3.1.1**
6	 (4 mark)	**10**	**3**	**1**	**1,3**	**1.1.1** **3.1.1**

	 (3 mark)  **(2 Mark)**					
8	(i) F= C ⊕ AB (4 mark) Diagram (1 mark) (ii)  (5 mark)	**5** **5**	**2**	**1**	**1,3**	**1.1.1** **3.1.1**