## Assignment-4 (Logic and Boolean Algebria)

Name: - Deepanshi Email ID:- d. 807@mybvc.ca Course Section: MATH 1901 24 JANMNRT 3 For question 1 to 5, please consider the following sets: A=93,5,7,97 B= 22,4, 6, 8,10) C= 9 12,14,18, 20,24) D= 121, 26, 31, 363 E= 99,6} U= 11,2,3,4,5,6,7,8,9,10} (Universal Set) Ques-1 of which sets) are the number 3 and 8 an element? Ans 1 This is an element of set(s) A and U
Set A = 13,5,7,97 For Number 3: and Set V = 11,2,3,4,5,6,7,8,9,10} FOH Number 8: This is an element of set (s) B and U Set B = 92,4,6,8,103 Set U= 91,2,3,4,5,6,7,8,9,10} Ques 2 Is the number 4EB and Is the number 26EC?

Ans	. 2.								
	Check whether 4 EB OH not 6-								
	Set 8 = 72,4,6,8,10)								
	Yes, the number/element belongs to B								
	The Marie Wall of the Control of the								
	check whether 26EK for not:								
	Set C = 212,14, 18, 20,24}								
	No, the number element belongs to C								
-0 $-$ 1	26 ¢ C . N. M								
Qus 3	What are all subsets for set E?								
Ans3	$E = \{a, b\}$								
	The set gaily has two (2) elements so there we								
	22 - 4 part +1. and +								
	22= 4 possible subsets, including the empty set and the set itself.								
	ser and the our uself.								
	Subsets are :								
	ф, чаў, ча, бў								
Prie	4: What is A?								
Ans	Ч								
	To find complement of A. my whiteact the								
	elements of set A from Universal set								
	A = U-A								

	$\bar{A} = U - A$
	= 91,2,3,4,5,6,7,8,9,10}-93,5,7,9}
	$\bar{\Lambda}$
	Ams: A = 11,2,4,6,8,103
	$\bar{A} = 41,2,4,6,8,10$
M.	
(1-5 Soln	
201	A= 23,5,7,9}
	8= 12,4, 6,8,10}
	0 = 921,2631,36
	U= {1,2,3,4,5,6,7,8,9,10}
	ANB = 23,5,7,9} 12,4,6,8,10}
	$An8 = \phi$
	40.07
	ANB = U-(ANB)
	= 91,2,3,4,5,6,7,8,9,103-0
7	1000) - 4100 - 71000
	(A08) = 41,2,3,4,5,6,7,8,9,10
	(ANB) UD = \$1,2,3,4,5,6,7,8,9,10} U (21,26,31,36}
Ans:-	(ANB)UD = {1,2,3,4,5,6,7,8,9,10,21,26,31,36}
<u>Q-6</u>	Write out the truth table for the expussion (ADB) U(MADB)

							4
Sal	76.0-	Inte	usection	1-AN	D (lonjur isjunction)	rction)	
		Un	ion_:-	OR LD	isjunction)		
		нА	VA -	complem	ent		
						1	
Am	A	В	Anb	νA	MANB	(ANB) U (MANB)	)
	F	F	F	T	F	F	
	F	T	F	T	T	T	<u> </u>
	T	F	F	F	F	F	
	T	T	T	F	F	T	
				1			
0	f.	nd so	Boolean	n table	400 (A.B	) + (A·B)?	
		rus - voi	1260000	<u> </u>	0		
Sal	ni .	/ <b>+</b> →.	Addition	N (DR)	7- /	A:- Inver	tivi
<u>Gyl</u>	=	· · · · · ·	Aultio	Lication	(AND)		
			- June 19	w.tt.			
Ans	A	В	A.B	Ā	Ā·B	$(A \cdot B) + (\bar{A} \cdot B)$	
	0	0	. 0	1	0	0	
	0	1.	0	1 1		4	
	}	0	0	0	0	0	
y V <sup>a</sup>	/ 1	1/1			0.	6	
1	1	-					
Λο	10th	1 1 000	`a cat	i imbl	amaists 4	he boolean expres	uion (AR)?
Ψ-δ		17		•			
Λ., ς	, ,	NA ON O		b		used to implem	out the
Anss	L 00 Pa	ZHND		gar	$\frac{1}{100}$	used so surpremi	CICKS_IFE
	DOOLE	un exp	HUNLON	)	<u>пв) :</u>		
			-				
		Α		O 0	<u> </u>	<u> </u>	
			<del>                                     </del>	A.B	O A.	В	
		B					
			AND		Λ		
						7 = A·B	
					B -	$\rightarrow$ $\mathcal{F}$	

	A B A·B A·B					
	0 0 1					
	0 1 0 11					
	1 0 0 1					
<u> </u>	Draw a circuit for the boolian expussion					
	A.B.C; If B is open and A, C is closed					
	1.1.0 0 1.1.0 0					
	Will electricity flow?					
An	99:- Parallel Circuit -> OR -> Boolean Addition (+)					
	Series Circuit -> AND -> Boolean Multiplication ()					
	Boolean Malapalation					
	1 A B C					
	When Bis open (0), and A, C is closed (1) state					
	due to opening of B the electricity is not passed in the circuit-					
	in the circuit-					
-	As A.B.C is a Boolean Multiplication expression					
	and it is supresented an Series circuit-					
<b>.</b>	Shotal and a single					
	gates to implement the boolean expression					
	expusion 14 oculean					
	A+BC + DEA					
	1110- 101					

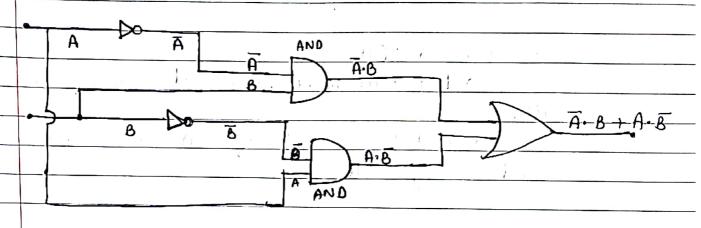
	10 A+BC+DEA	10 10 10 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1					
Soln	10	· · · · · · · · · · · · · · · · · · ·					
	Firstly, start with A+BC, where BC can be implemented using IAND logic gate.						
<b>→</b>	tinstly, start mure land land oute.						
	implemented theing	0					
	a ha in planted	using OR logic gate.					
<b>→</b>	A+BC van be implemented	8 0 0					
	Now more to DEA  → DEA can be implemented  gate.  → And the result of DEA  inverted using NOT gate.	• /.					
	Now more to DET	using AND logic					
	THE WAY DE COMPANY OF	0					
	gall.	can be converted					
	NOT cate	^					
	involle wing worging						
	1.00						
	B. BC   BC   All all						
_,							
	(AND)						
	AtBC						
	(08)	A+8C+ DEA = Y					
		(OF)					
	A	y is the					
	E DEA DEA	Owput					
	(TOM) (ANA)	Y= A+BC+DEA					
4							
Ques	1 what logic gate implements the	boolean expression					
	0 0						
ſ	$(\bar{A} \cdot B) + (A \cdot \bar{B})$						
Anv	11: Exclusive OR (EOR) logu	gate is used to					
	11: Exclusive OR (EOR) logic implements the boolean expression	(A.B) + (A.B)					



• A.B. can be implemented using AND gate for A and 1B.

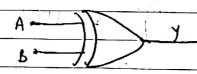
• A.B. can be implemented using AND gate for A and B.

• By getting final result we use OR gate for A.B. and D.B.



Y =	A.B	+ A . B	=	A 🕀 B
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Truth Table !-

<u> </u>	T-							
_	A	B	Ā	<u></u>	A·B	A. Ř	A. A + A. A	1
	0	0	1		0	D	0	1
	0	)	1,	0	1	0	1	-
	1	0	0	1	0		1	_
	1	1	0	0	0	0	0	_
								4

