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Name :	A
Roll No.:	An Alasman O'S security and Explana
Invigilator's Signature :	

CS/BCA/SEM-1/BCA-101/2012-13

2012 **DIGITAL ELECTRONICS**

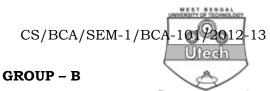
Time Allotted : 3 Hours Full Marks: 70

		Tr	ne figures in the	margın indica	te full marks.	
$C\alpha$	andid	ates	are required to g	give their ansı	vers in their own wor	ds
			as far	as practicable	e.	
			G	ROUP – A		
			(Multiple Cho	oice Type Q	uestions)	
1.	Choose the correct alternatives of the following:					
					10 × 1 =	= 10
	i) The Boolean equation of AND operation is					
		a)	$Y = \overline{A}$	b)	Y = AB	
		c)	Y = A + B	d)	None of these.	
	ii) The logical expression $Y = A + \overline{A}B$ is equivalent to					
		a)	Y = AB	b)	$Y = \overline{A}B$	
		c)	$Y = A + \overline{B}$	d)	Y = A + B.	
	iii) The BCD equivalent of 57 is					
		a)	111001	b)	01010111	
		c)	101111	d)	10001010.	
	iv) In the BCD code, the decimal number 123 is written as				as	
		a)	11011	b)	C3	
		c)	001010011	d)	000100100011.	

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v)		carry look-ahead add	er is	
	addi	ition, because it		As planted (y Exceptiolity 2nd Excellent
	a)	is faster	b)	is more accurate
	c)	uses fewer gates	d)	costs less.
vi)		ombinational circuit is ends on the	s one	e in which the output
	a)	input combination at a	a time	
	b)	previous output and ir	iput (combination
	c)	previous input and inp	out co	ombination at a time
	d)	present output and pre	eviou	s output.
vii)	Each individual term in standard SOP form is called as			
	a)	Maxterm	b)	Minterm
	c)	Midterm	d)	None of these.
viii)	A de	ecoder with 64 output li	nes h	nas data inputs.
	a)	64	b)	1
	c)	6	d)	None of these.
ix)		number of flip-flops anter is	requi	red to build a Mod-15
	a)	4	b)	5
	c)	6	d)	7.
x)	The	full form of CCD is		
	a)	Charged-couple disk	b)	Charge-coupled device
	c)	Cache coupled device	d)	None of these.



(Short Answer Type Questions)

Answer any three of the following.

 $3 \times 5 = 15$

- 2. Draw a full adder circuit as combination of 2 half adders.
- 3. State Demorgan's law and prove it for 2 variables.
- 4. a) Evaluate $(7352)_{10}$ – $(9456)_{10}$ using 9's compliment.
 - State Duality principle. b)
- Minimize the following Boolean expression using K-map. 5. $F(A,B,C,D) = \Sigma(0,1,3,6,8,10,11,13,15)$
- Design a 4 bit parallel-in parallel-out (PIPO) shift register. 6.

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following.

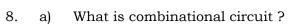
 $3 \times 15 = 45$

- 7. Represent the decimal number 45 in a)
 - Hexadecimal code i)
 - Gray code ii)
 - iii) BCD code.
 - b) Which gates are called universal gates and why?
 - Design a 2 × 4 decoder. Give truth table and draw c) circuit diagram using basic gates.
 - d) Implement the expression using a Multiplexer.

$$F(A,B,C,D) = \sum (0,1,4,5,7,9,11,13,15)$$

3 + 5 + 4 + 3

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- b) Differentiate between combinational and sequential circuit.
- c) Explain the functionality of clocked JK flip-flop. Give truth table and diagram.

d) Convert SR to JK flip-flop.

$$2 + 3 + 5 + 5$$

- 9. a) What is register?
 - b) Design a decimal to binary encoder.

c) What do you mean by Johnson counter?

$$3 + 6 + 6$$

10. a) Given the following truth table.

X	Y	Z	F
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

Obtain the SOP and POS form and draw the circuit diagram.

- b) Express the following Boolean expressions:
 - i) f = AB + A'C in POS form.

ii)
$$f = (A + BC)(B + C' A)$$
 in SOP form.

8 + 7

- 11. a) What is the difference between synchronous and asynchronous counter?
 - b) Write short notes on the following:
 - i) EPROM
 - ii) DRAM.
 - c) What is the difference between SRAM and DRAM?

4 + 6 + 5

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