higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

NOVEMBER EXAMINATION

LOGIC SYSTEMS N2

17 NOVEMBER 2016

This marking guideline consists of 6 pages.

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QUESTION 1

1.1

Operation	Results	Borrow
1 – 1	0	**1.1.1 (0)**✓
0 – 0	0	0
1 – 0	**1.1.2 (1)**✓	**1.1.3 (0)**✓
0 – 1	**1.1.4 (1)**✓	**1.1.5 (1)**✓

(5)

1.2 1.2.1

		1	1	1	0	1	
-		1	0	0	1	1	
	1	**1**	**0**	**0**	**0**	**0**	✓✓

32	16	8	4	2	1
1	**1**	**0**	**0**	**0**	**0**

$\therefore 110000_2 = 32 + 16$✓
$= 48_{10}$✓

1.2.2

		1	1	0	1		
x		0	0	1	1		
		1	1	0	1		
	1	1	0	1		✓	
1	**0**	**0**	**1**	**1**	**1**	✓	

$\therefore 100111_2 = 32 + 4 + 2 + 1$ ✓
$= 39_{10}$ ✓

(2 × 4) (8)

1.3

	32	**16**	**8**	**4**	**2**	**1**
60 =	1	1	1	1	0	0

✓

	8	**4**	**2**	**1**
15 =	1	1	1	1

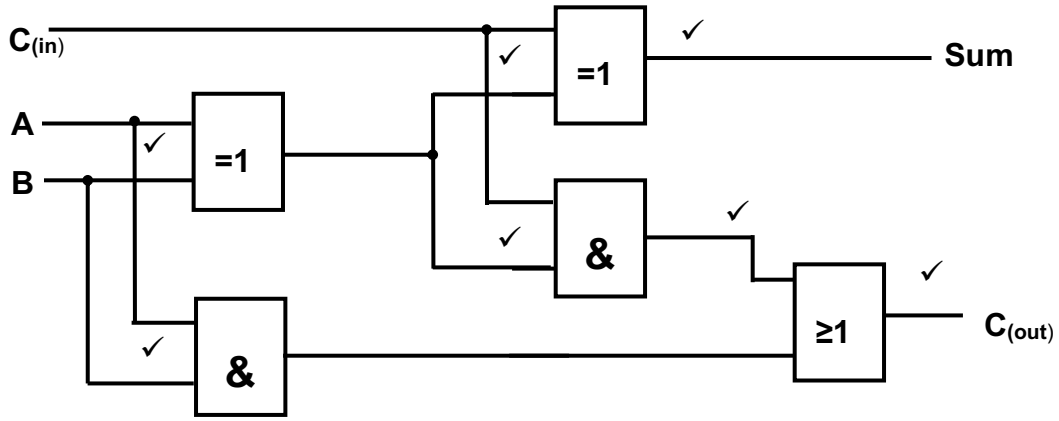
✓

					1	0	0✓
1	1	1	1	1	1	1	0
				1	1	1	↓
				0	0	0	0
					0	0	0
				0	0	0	0
					0	0	0
					0	0	0

↓ ↓✓ ↓ 0↓ 0✓

(5)

1.4



(7)
[25]

QUESTION 2

2.1

8	4	1
+3	+3	+3
11	07	04
↓	↓	↓
1011✓	**0111✓**	**0100✓**

(3)

2.2 An encoder is a circuit or a device used to convert decimal/analog✓ to binary/digital.✓
A decoder is a circuit used to convert binary/digital✓ to decimal/analog.✓ (4)

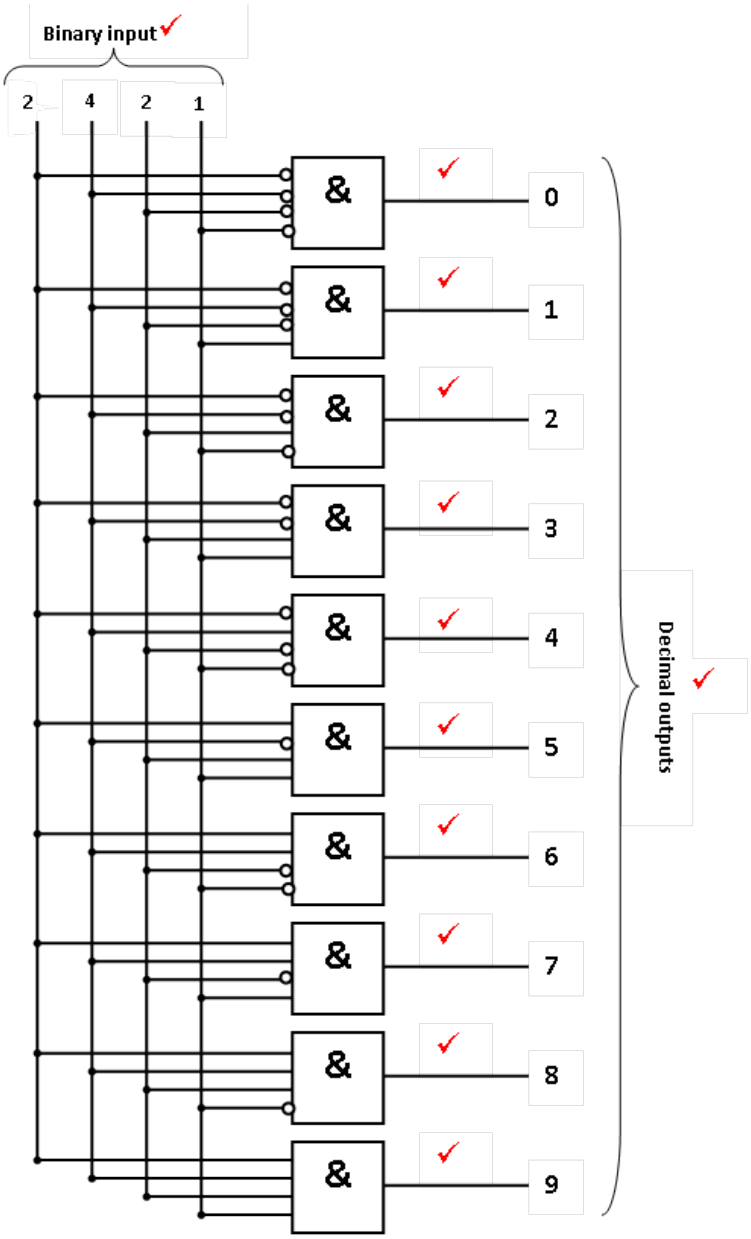
2.3

7421 BCD code		**Decimal equivalent**
MSD	LSD	
(2.3.1) 0101✓	0100	54
1000	0110	**(2.3.2) 76✓**
1000	**(2.3.3) 0001✓**	81
(2.3.4) 1010✓	0010	92
0011	**(2.3.5) 0000✓**	30

(5)

2.4 LSD – Least Significant Digit✓ (1)

2.5



(12)
[25]

QUESTION 3

3.1

3.1.1	A
3.1.2	A
3.1.3	C
3.1.4	C
3.1.5	C
3.1.6	B
3.1.7	D

(7 × 1) (7)

3.2

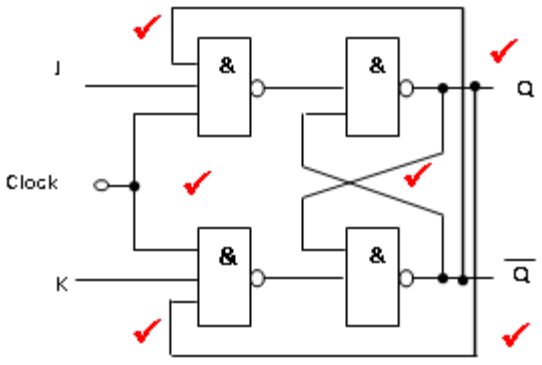
A	B	C	Z	
0	0	0	**1**	
0	0	1	**1**	✓
0	1	0	**1**	
0	1	1	**1**	✓
1	0	0	**1**	
1	0	1	**1**	✓
1	1	0	**1**	
1	1	1	**0**	✓

(4)

3.3 3.3.1

- Figure 1(a) is a SR latch✓,
- Figure 1(b) is Clocked JK flip-flop✓ (2)

3.3.2



(6)

3.4 USB – Universal Serial Bus✓✓ (2)

3.5

- Punch cards
- Magnetic tape
- CD ROM
- Stiffy disc
- Floppy disc
- Flash drive
- DVD
- Hard drive

(Any 5 × 1) (4)
[25]

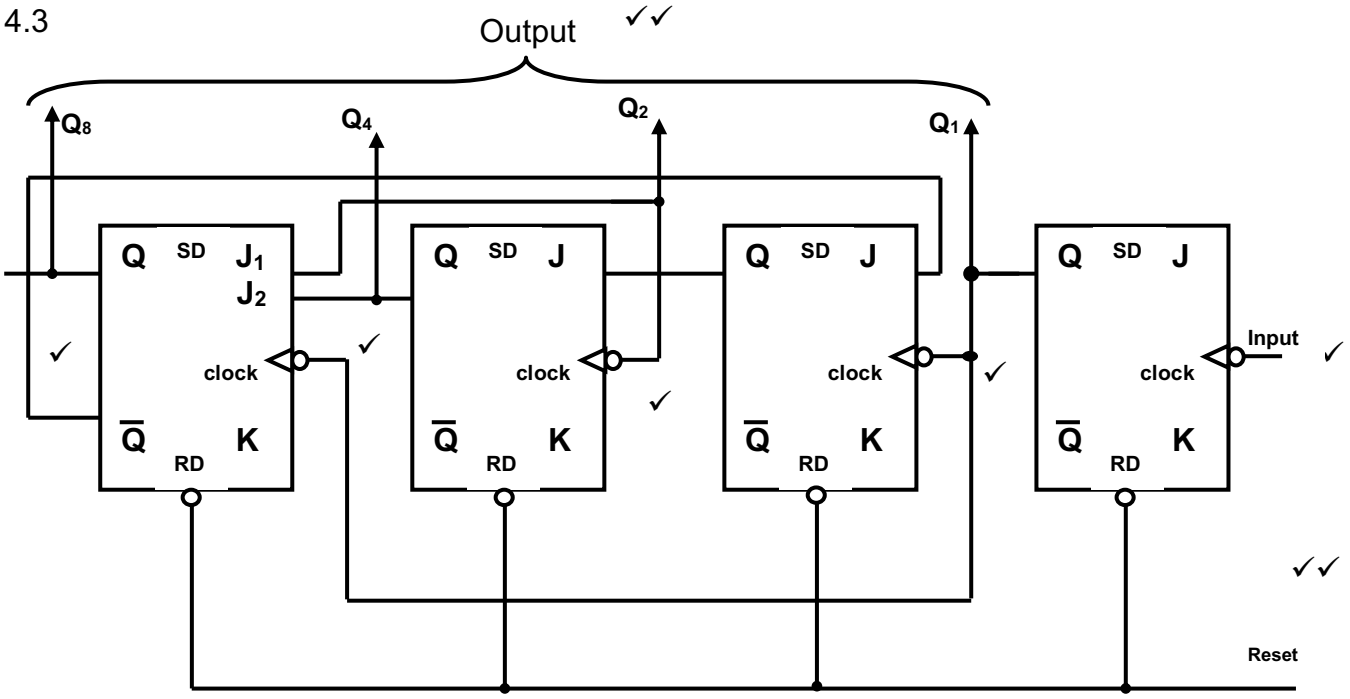
QUESTION 4

4.1 In a PIPO shift register the inputs are entered at the same time. ✓✓
In a SIPO shift register the inputs are entered one at time.✓✓ (2 × 2) (4)

4.2 A counter is an electronic circuit which executes the counting function by counting the number of pulses applied to the input.✓ ✓
A shift register Is a group of flip-flops connected in such a way that data is shifted in a specific way every time the register is clocked.✓✓ (2 × 2) (4)

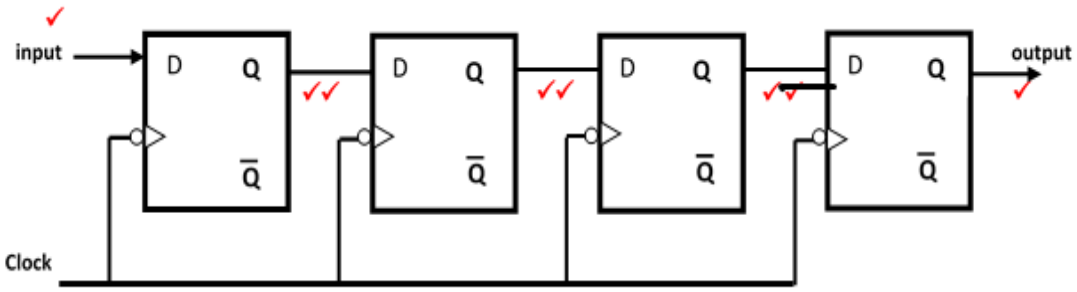
4.2.2 Four clock pulses✓✓ (2)

4.3



(9)

4.4



(8)
[25]

TOTAL: 100

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