higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

LOGIC SYSTEMS N5

24 November 2022

This marking guideline consists of 7 pages.

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QUESTION 1

A	B	C	J_A	K_A	J_B	K_B	J_C	K_C	
0	1	1	1	Ø	Ø	1	Ø	1	
1	0	0	Ø	0	0	Ø	1	Ø	
1	0	1	Ø	0	1	Ø	Ø	1	Λ
1	1	0	Ø	1	Ø	0	1	Ø	
0	0	0	0	Ø	1	Ø	1	Ø	
0	0	1	0	Ø	1	Ø	Ø	0	
0	1	0	0	Ø	Ø	0	1	Ø	Λ
1	1	1	Ø	1	Ø	0	Ø	0	

$Q_n \rightarrow Q_n + 1$	J	K
0 → 0	0	Ø
0 → 1	1	Ø
1 → 0	Ø	1
1 → 1	Ø	0

J_A = BC Λ

	00	01	11	10	
0	0	0	Ø	Ø	Λ
1	0	1	Ø	Ø	

K_A = B Λ

	00	01	11	10	
0	Ø	Ø	1	0	Λ
1	Ø	Ø	1	0	

J_B =/A + C Λ

	00	01	11	10	
0	1	Ø	Ø	0	Λ
1	1	Ø	Ø	1	

K_B = /AC Λ

	00	01	11	10	
0	Ø	0	0	Ø	Λ
1	Ø	1	0	Ø	

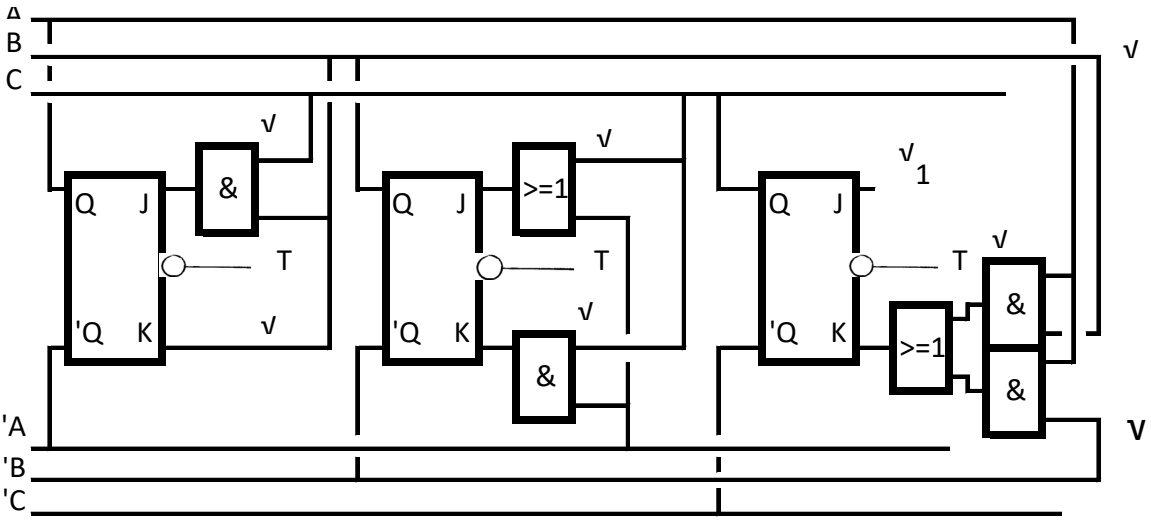
J_C = 1 Λ

	00	01	11	10	
0	1	1	1	1	Λ
1	Ø	Ø	Ø	Ø	

K_C AB + A/B Λ

	00	01	11	10	
0	Ø	Ø	Ø	Ø	Λ
1	0	1	0	1	

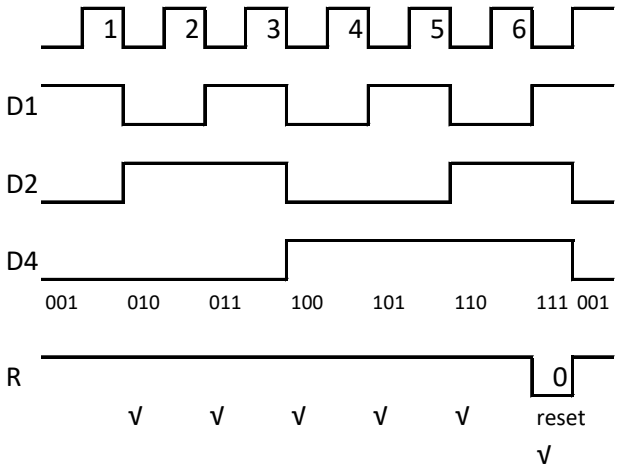
(7)



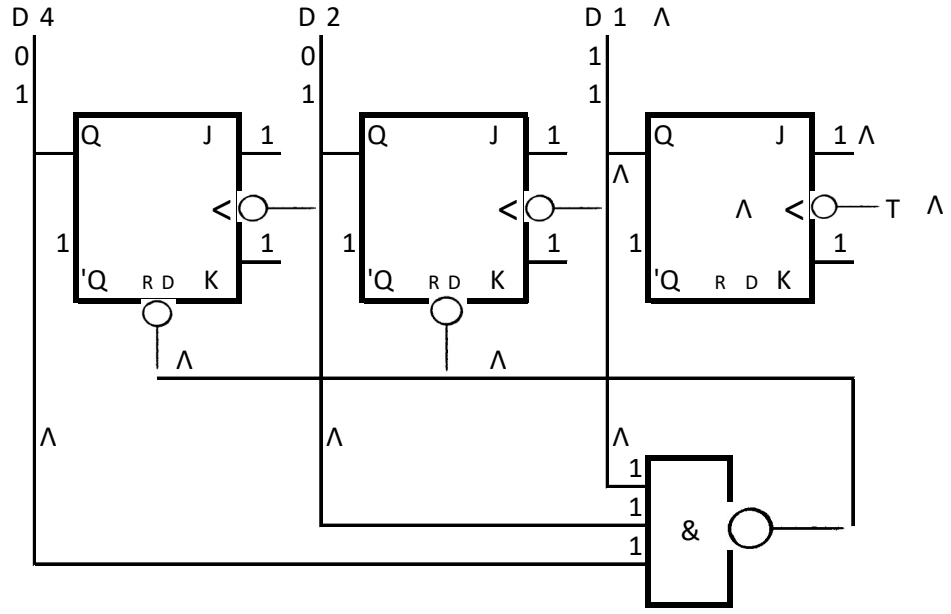
(8)
[15]

QUESTION 2

	D4	D2	D1	T	
	0	0	1	0	T
	0	1	0	1	√
	0	1	1	2	
	1	0	0	3	√
	1	0	1	4	
	1	1	0	5	√
	1	1	1	6	
Reset	0	0	1	6	√



(10)

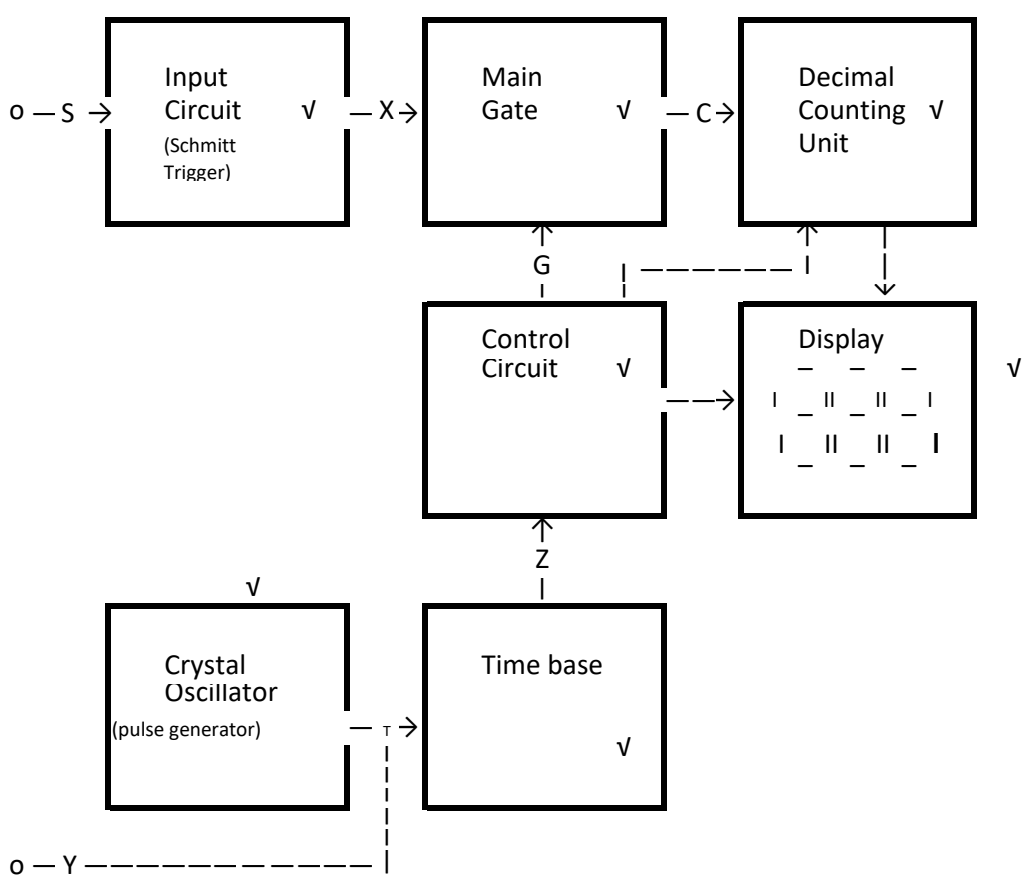


Λ= 1/2 mark 10 * 1/2 = 5 marks (5)

[15]

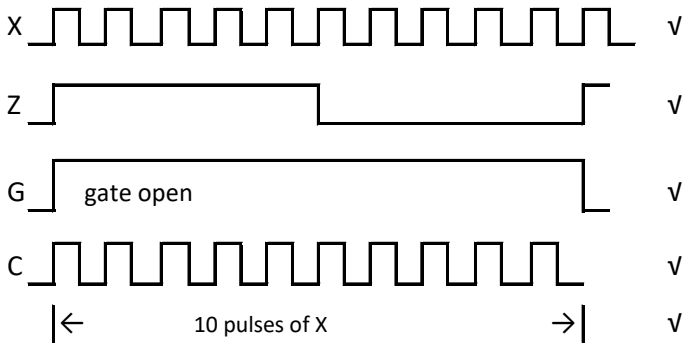
QUESTION 3

3.1



(7)

3.2



Frequency of X = 10 pulses per time interval G (5)

[12]

QUESTION 4

4.1 Right-shift Johnson counter. (1)

4.2 Left-shift Johnson counter. (1)

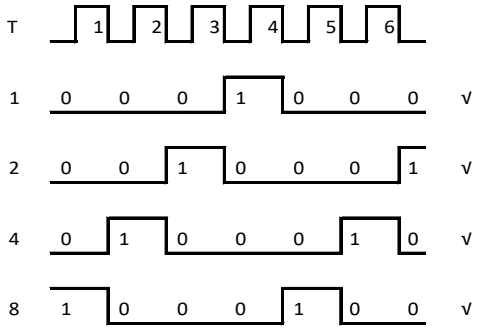
4.3 Left-shift register. (1)

4.4 Right-shift ring counter. (1)

4.5 Left-shift ring counter. (1)

4.6 0100, 0010, 0001. (3)

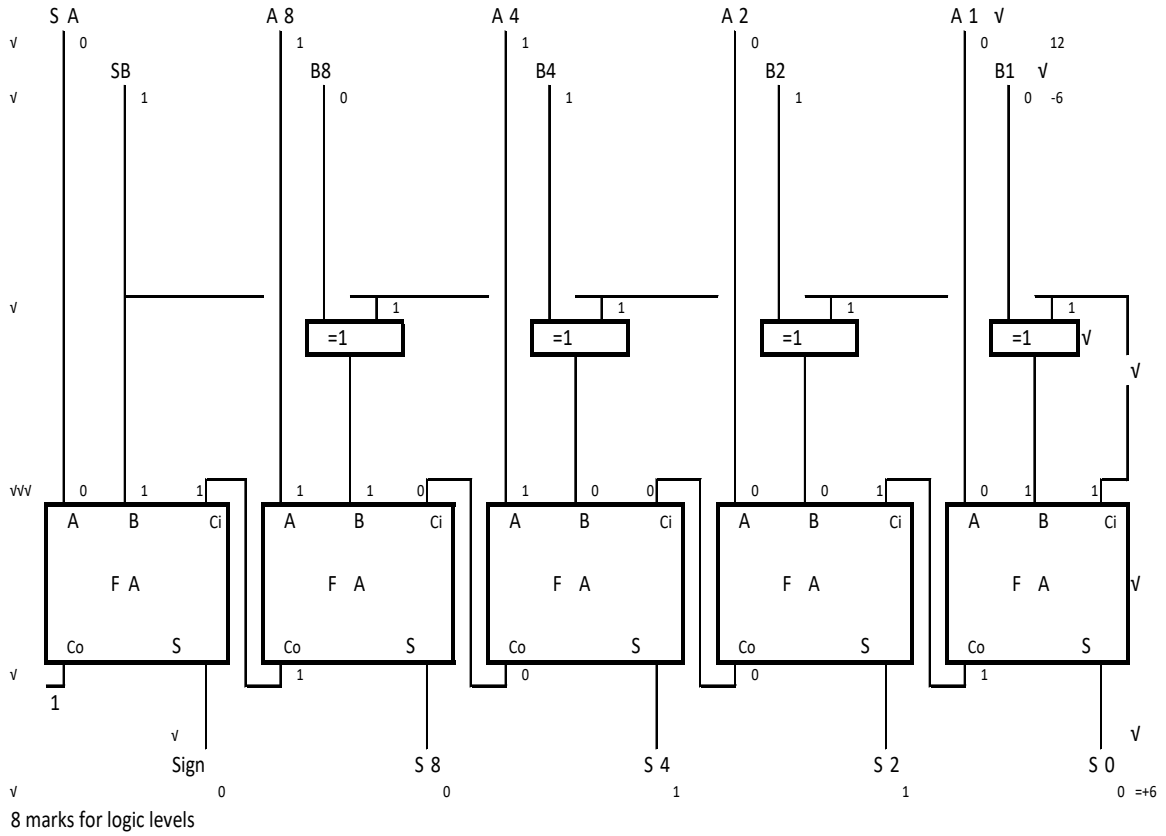
4.7



Clock pulse = √ (5)

[13]

QUESTION 5



[15]

QUESTION 6

6.1 ROM is read-only memory, which is used to store fixed data and start up programs.
RAM is read-and-write memory, which is used to store program instructions during program execution. (4)

6.2 A personal computer needs RAM to store program instructions during execution. It also needs ROM to store the start-up routines. (3)

6.3 A CD-ROM is a pre-pressed optical compact disc that contains data. CD-ROM is an acronym, which stands for Compact Disc Read-Only Memory. Although computers can read CD-ROMs, they cannot write on CD-ROMs that are not writable or erasable. (3)

6.4 A DVD (which stands for "digital video disc" or "digital versatile disc") is a digital, optical disc storage format invented and developed by Philips, Sony, Toshiba, and Panasonic in 1995. DVDs can be played in various types of players, including DVD players. Although they have the same dimensions, DVDs have a far greater storage capacity than compact discs. (3)

6.5 Electrically Erasable Programmable Read-only Memory. (2)

[15]

QUESTION 7

7.1 character
7.2 spins
7.3 hammer
7.4 presses
7.5 character
7.6 print
7.7 striking
7.8 paper
7.9 matrix
7.10 pressure
7.11 rod
7.12 electromagnet
7.13 chain
7.14 character
7.15 hammer

(15 × 1) **[15]**

TOTAL: 100