higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

LOGIC SYSTEMS N5

9 April 2020

This marking guideline consists of 6 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	√
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	√
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 √

	00	01	11	10	
0	0	0	Ø	Ø	√
1	0	1	Ø	Ø	

K_A = B √

	00	01	11	10	
0	Ø	Ø	1	0	√
1	Ø	Ø	1	0	

J_B =/A + C √

	00	01	11	10	
0	1	Ø	Ø	0	√
1	1	Ø	Ø	1	

K_B = /AC √

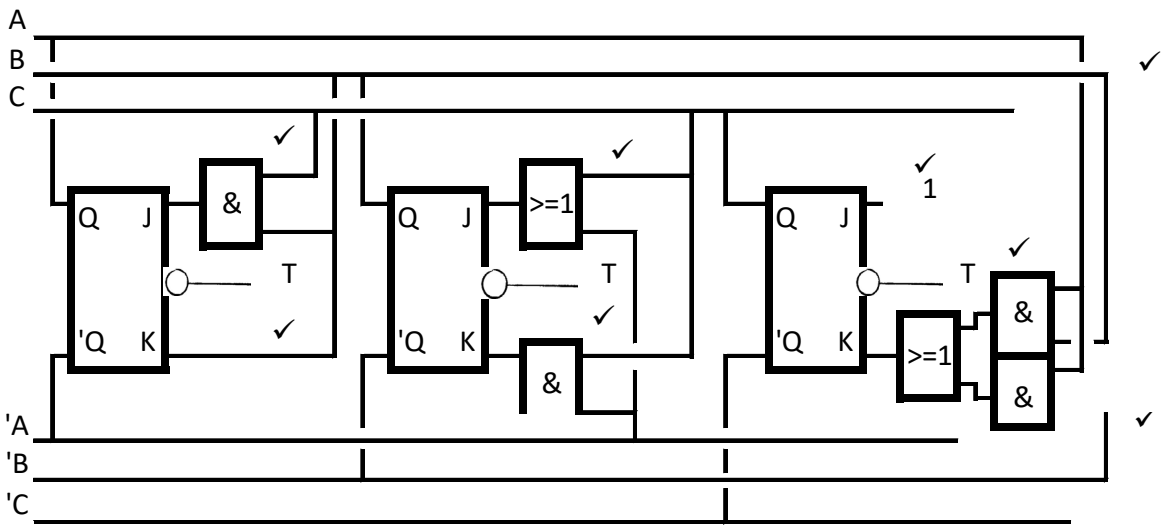
	00	01	11	10	
0	Ø	0	0	Ø	√
1	Ø	1	0	Ø	

J_C = 1 √

	00	01	11	10	
0	1	1	1	1	√
1	Ø	Ø	Ø	Ø	

K_C AB + A/B √

	00	01	11	10	
0	Ø	Ø	Ø	Ø	√
1	0	1	0	1	

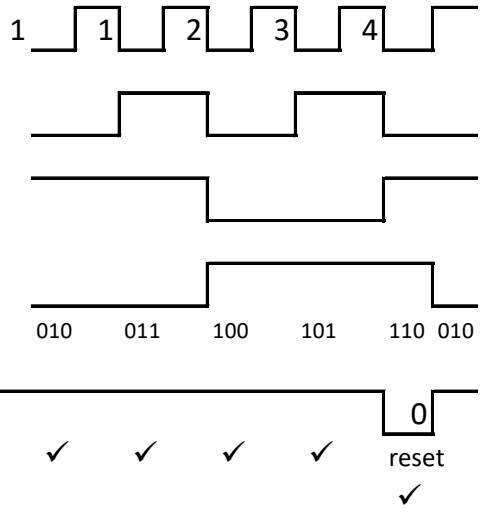


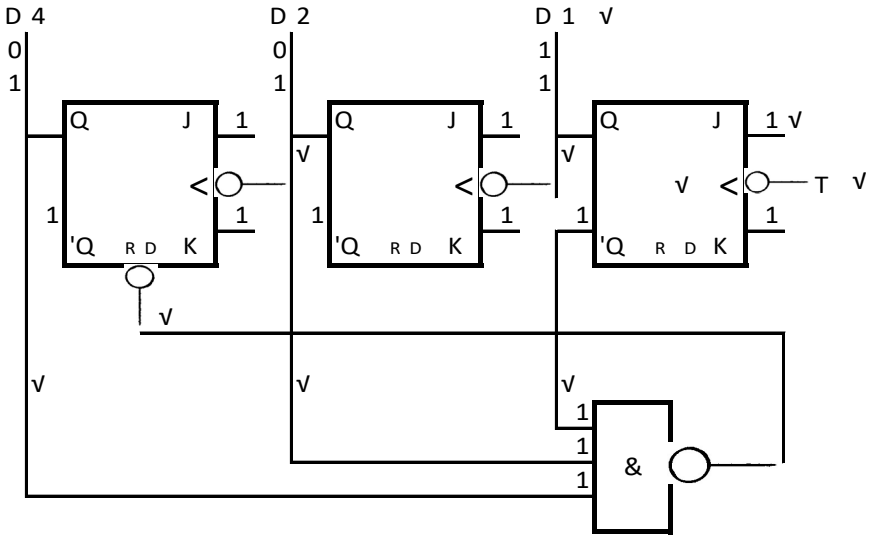
(7 + 8) **[15]**

QUESTION 2

D4	D2	D1	T
0	1	0	0
0	1	1	1
1	0	0	2
1	0	1	3
Reset 1	1	0	4
0	1	0	

T ✓ ✓ ✓ ✓





(10 + 5) **[15]**

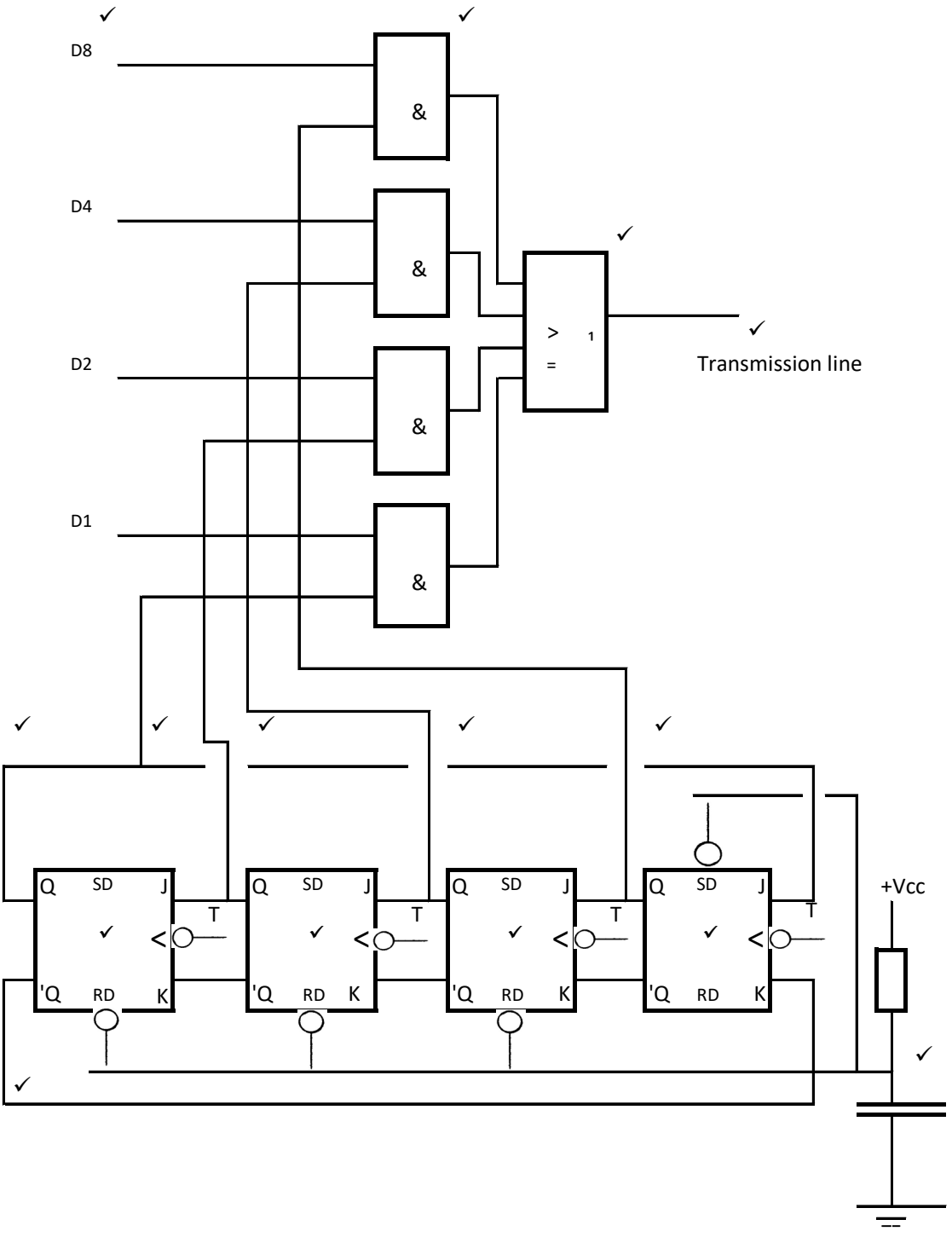
QUESTION 3

3.1 A gate is manually started (opened) and stopped (closed). During this period the total number of pulses are counted and displayed. (5)

3.2 A gate is kept open electronically by a time-base divider for an exact period (usually one second). During this period the number of clock pulses are counted and displayed giving the frequency of the clock pulses. (5)

3.3 A divide-by-60 counter counts a 1 Hz pulse and displays seconds counted. A second divide-by-60 counter counts every 60 seconds and displays the minutes counted. A third divide-by-12 counter counts every 60 minutes and displays hours counted. (5)
[15]

QUESTION 4



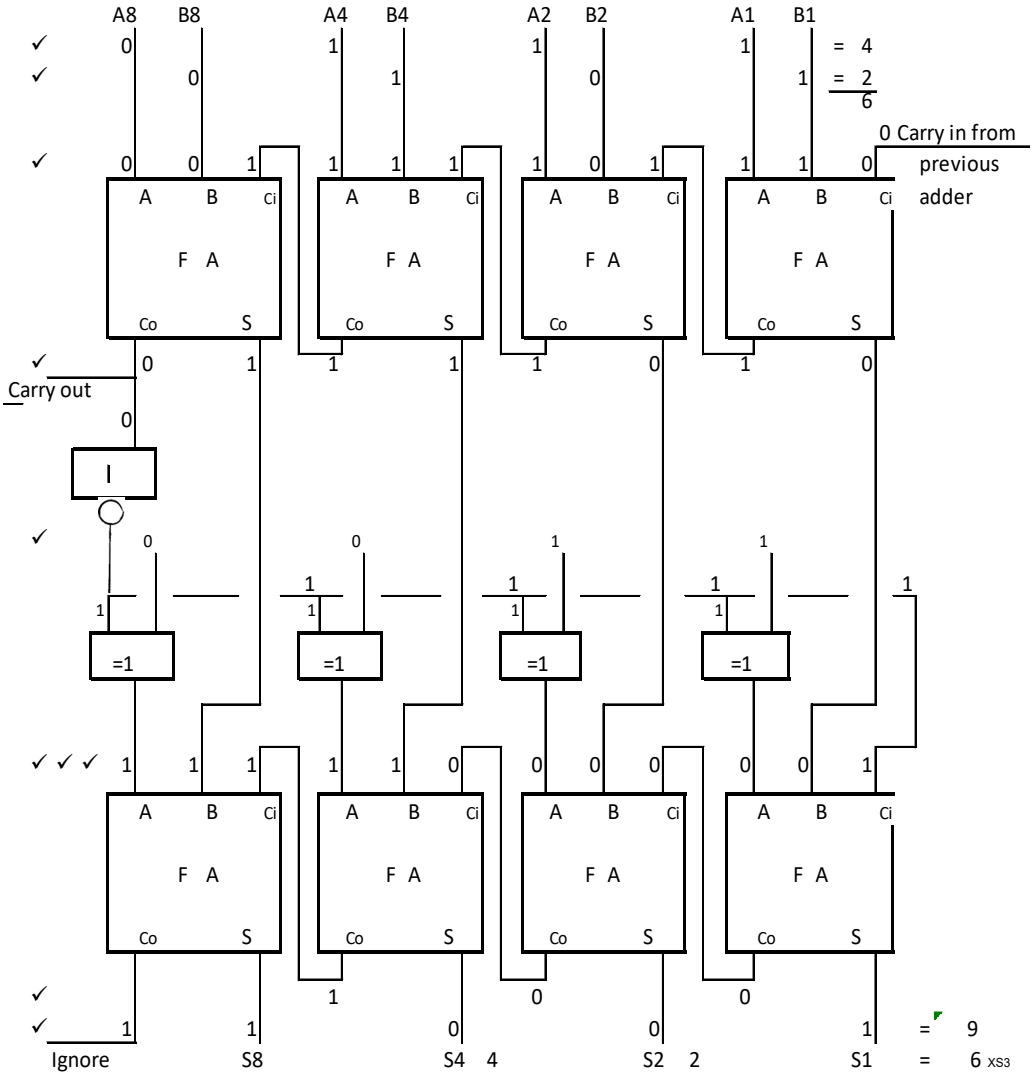
[15]

QUESTION 5

5.1 If the digit (column) sum exceeds 9✓ add 6.✓ If the digit (column) sum is 9 or less✓ add 0.✓ (4)

5.2 Excess 3 BCD adder (1)

5.3



(10 marks for logic levels) (10)

[15]

QUESTION 6

6.1 ROM is read-only memory used to store fixed data and start-up programs. RAM is read-and-write memory used to store program instructions during program execution. (2 + 2) (4)

6.2 Personal computers need RAM to store program instructions during execution and also need ROM to store computer start-up routines. (3)

6.3 A CD-ROM is a prepressed optical compact disc which contains data. The name is an acronym which stands for 'compact disc read-only memory'. Computers can read CD-ROMs, but cannot write on CD-ROMs which are not writable or erasable. (3)

6.4 DVD (sometimes explained as '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 many types of players, including DVD-players. DVDs offer higher storage capacity than compact discs while having the same dimensions. (3)

6.5 Electrically erasable programmable read-only memory (2)
[15]

QUESTION 7

7.1
7.1.1 Impact
7.1.2 Nonimpact
7.1.3 Impact
7.1.4 Impact
7.1.5 Nonimpact
(5 × 1) (5)

7.2
7.2.1 False
7.2.2 False
7.2.3 True
7.2.4 False
7.2.5 True
(5 × 1) (5)
[10]

TOTAL: 100

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