



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE DIGITAL ELECTRONICS N5

9 April 2020

This marking guideline consists of 7 pages.

1.3 $11,2_8 \times 10,125_{10}$

$11,2_8 \times 10,125_{10}$
 $11,2_8 = 001\ 001,010_2 \checkmark$
 $10,125_{10}$

2^3	2^2	2^1	2^0	2^{-1}	2^{-2}	2^{-3}
1	0	1	0	0	0	1

✓

$$\begin{array}{r}
 100101 \\
 1010001 \\
 \hline
 100101 \checkmark \\
 1001010000 \\
 100101000000 \\
 \hline
 101110110101 \checkmark
 \end{array}$$

$\therefore 1001,01_2 \times 1010,001_2 = 1011101,10101_2 \checkmark$

$\therefore 1001,01 \times 1010,001 = 1011101,10101 = 1011101,1010 = 5D,A8_{16}$

(6)
[18]

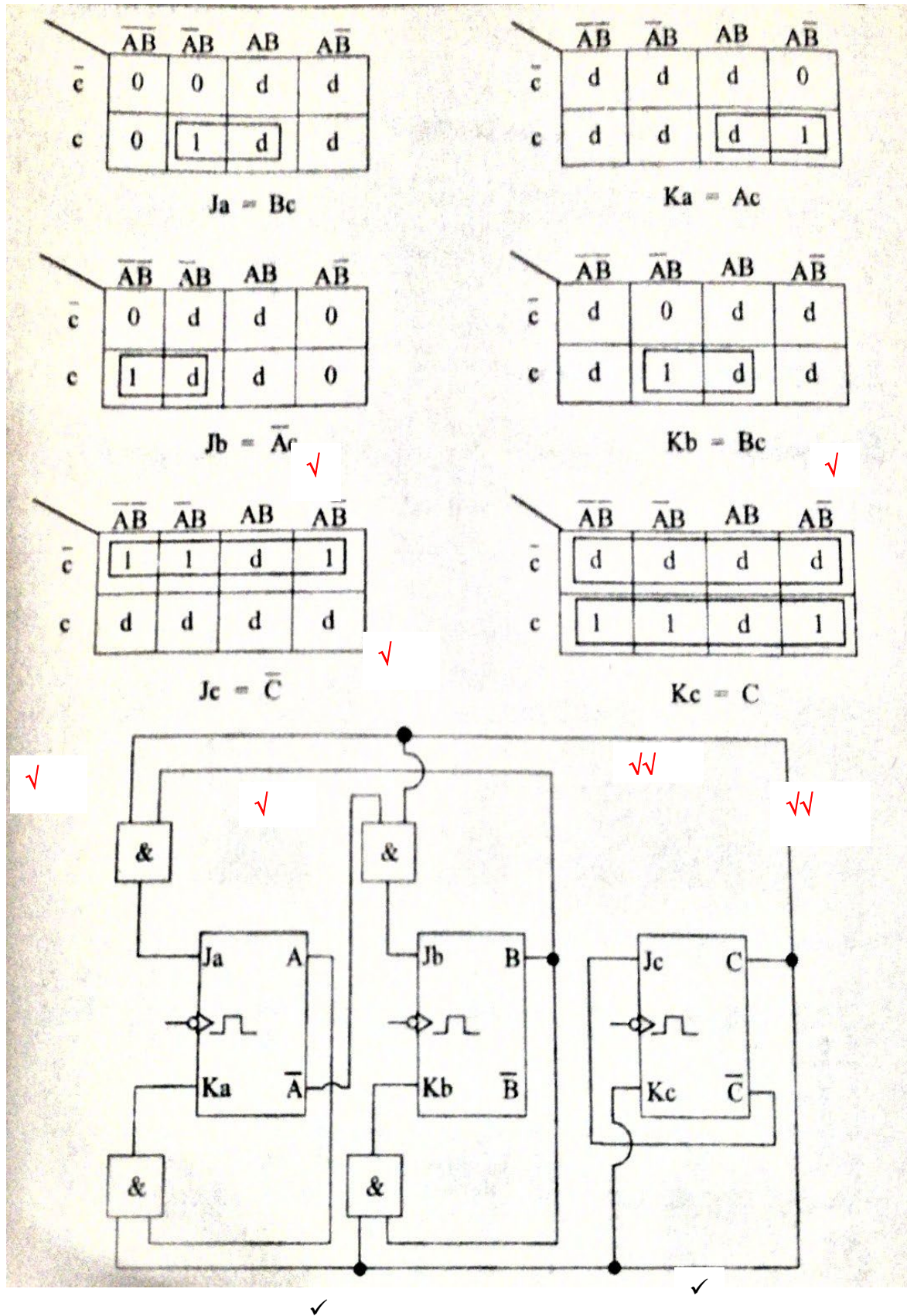
QUESTION 2

A	B	C		J _A	K _A		J _B	K _B		J _C	K _C
0	0	0		0	d		0	d		1	d
0	0	1		0	d		1	d		d	1
0	1	0		0	d		d	0		1	d
0	1	1		1	d		d	1		d	1
1	0	0		d	d		0	d		1	d
1	0	1		d	0		1	d		d	1
1	1	0		d	d		d	d		d	d
1	1	1		d	d		d	d		d	d

✓
✓
✓
✓
✓
✓
✓
✓

(9)

(9)



(13)
 [22]

QUESTION 3

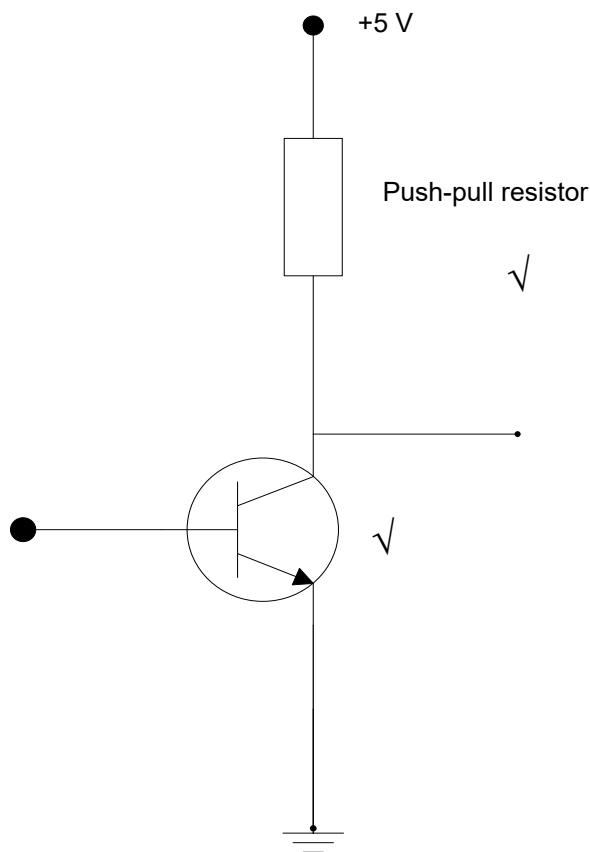
- 3.1 3.1.1 G
- 3.1.2 E
- 3.1.3 A
- 3.1.4 F
- 3.1.5 H
- 3.1.6 B
- 3.1.7 D

(7 × 1) (7)

3.2 $V_H = V_{OH} - V_{IH} = 20 - 3 = 17\text{ V} \checkmark$
 $V_L = V_{IL} - V_{OL} = 0,9 - 0,5 = 0,4\text{V} \checkmark$

(2)

- 3.3 3.3.1



(3)

3.3.2 The purpose of the pull-up resistor is to allow the output to be wired to the input of the next stage.

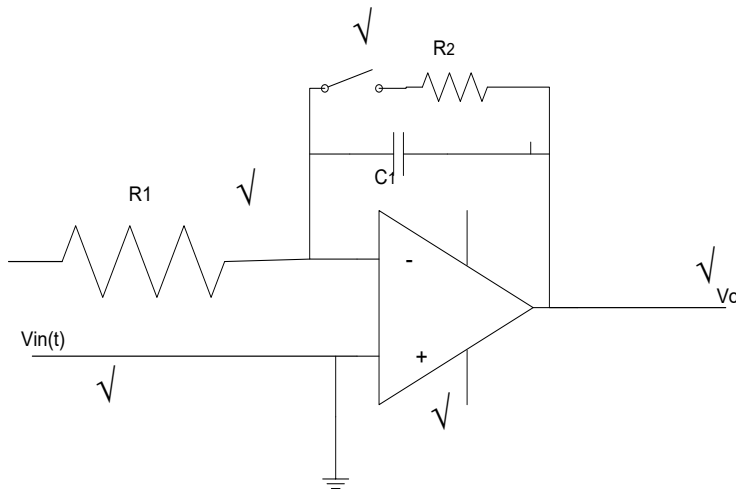
(3)
[15]

QUESTION 4

- 4.1 4.1.1 True
- 4.1.2 True

(2 × 1) (2)

4.2



(5)

4.3

$$V_O = \frac{NVT}{RC}$$

$$= \frac{2560 \times 2 \times 2 \times 10^{-3}}{100 \times 10^3 \times 100 \times 10^{-6}} \checkmark = 1,024 \text{ V} \checkmark \checkmark$$

(3)

[10]

QUESTION 5

5.1 The data is arranged on concentric tracks that are divided into sectors. Each sector with its track is called a block. (3)

5.2 5.2.1 Electrically erasable programmable read-only memory

5.2.2 Programmable read-only memory

5.2.3 Random access memory

5.2.4 Read-only memory

5.2.5 Erasable programmable read-only memory

(NOTE TO MARKERS: 2 marks for the full correct meaning of the acronym, i.e. either 2 marks for each acronym or no marks.)

(5 × 2) (10)

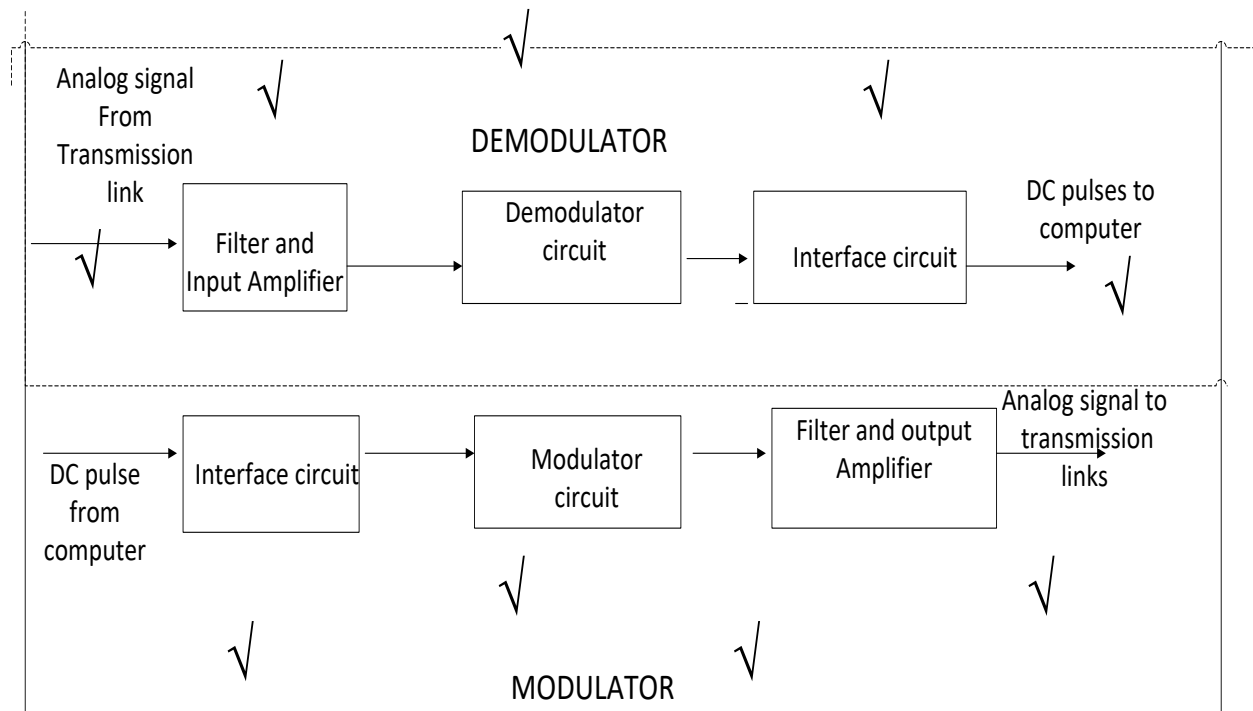
5.3 Programmed once by the manufacturer and cannot be changed, it is made from specifications supplied by the user, it is expensive and only suitable if a large quantity is required. (2)

[15]

QUESTION 6

- 6.1 6.1.1 Electrostatic printer – It uses special coated paper on which electrostatic charges are placed by conducting nibs. A liquid toner is then attached to these charges. (3 × 3) (9)
- 6.1.2 Thermal printer – The image is burned onto the outer layer. The toner then covers these burned areas.
- 6.1.3 Ink-jet printer – Electrically charged ink droplets are carried to the nibs through capillaries. These droplets are deflected by an electric field to fall on the paper so as to form characters.
- 6.2 • It requires special paper to print on.
 • Burning has a slight smell. (2)
 [11]

QUESTION 7



[9]

TOTAL: 100