



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

RADIO AND TELEVISION THEORY N3

30 November 2023

This marking guideline consists of 7 pages.

SECTION A**QUESTION 1**

- 1.1 A
- 1.2 B
- 1.3 A
- 1.4 A
- 1.5 A

(5 × 1) [5]

QUESTION 2

- 2.1 True
- 2.2 True
- 2.3 True
- 2.4 True
- 2.5 True

(5 × 1) [5]

QUESTION 3

- 3.1 F
- 3.2 A
- 3.3 G
- 3.4 B
- 3.5 H
- 3.6 C
- 3.7 D
- 3.8 E
- 3.9 I
- 3.10 J

(10 × 1) [10]

QUESTION 4

- 4.1 Diode
- 4.2 Chrominance or chroma
- 4.3 Aerial or antenna
- 4.4 Contrast
- 4.5 Power

(5 × 1) [5]

TOTAL SECTION A: 25

SECTION B**QUESTION 5**

5.1 5.1.1 $0,89 \text{ V} + 0,7 \text{ V} \checkmark = 1,59 \text{ V} \checkmark$

5.1.2 $1 \text{ V} - 0,41 \text{ V} \checkmark = 0,59 \text{ V} \checkmark$

5.1.3 $1 \text{ V} - 0,89 \text{ V} \checkmark = 0,11 \text{ V} \checkmark$

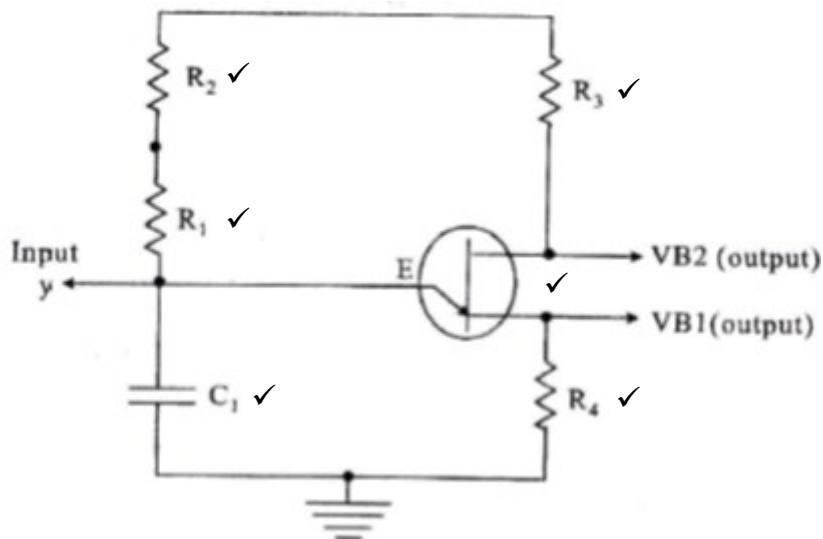
5.1.4 $0,59 \text{ V} + 0,11 \text{ V} \checkmark = 0,7 \text{ V} \checkmark$

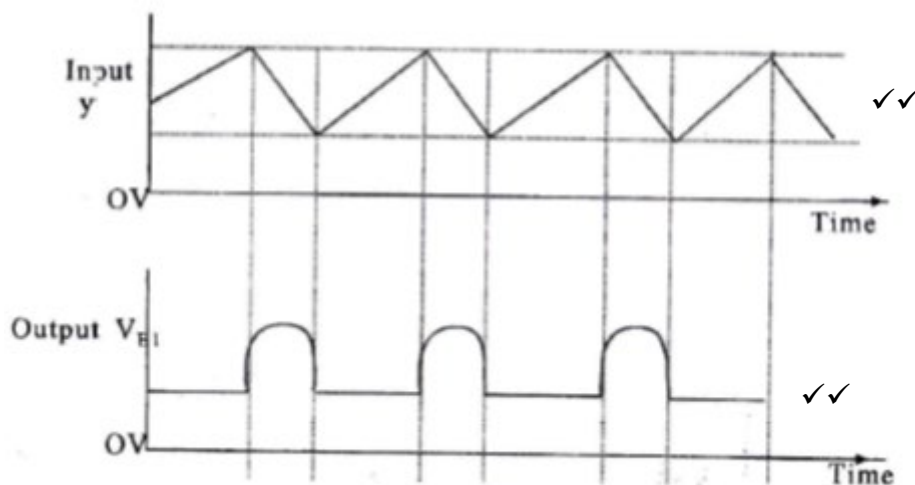
(4 × 2) (8)

- 5.2
- Saturation:✓ The amount of colour. It indicates the concentration or degree of purity of colour; a measure of the absence of white in a colour. ✓
 - Hue:✓ The colour itself. Examples: red, blue, green, and magenta. ✓
 - Luminance:✓ The intensity or brightness information of a scene. This signal is obtained in a colour picture by adding proportions of red, green and blue.✓

(3 × 2) (6)

[14]

QUESTION 6

**[10]****QUESTION 7**

- 7.1 Overall colour cast: The receiver using RGB drivers will experience partial failure✓ or total failure of one of the output stages, which will impact the colour balance.✓ A DC voltage check will normally isolate the faulty stage.✓
- 7.2 Luminance delay line: If the luminance delay line goes open circuit, it will stop the high frequencies of the signal,✓ leaving only the chrominance on the screen.✓ An oscilloscope can be used in fault-finding, observing waveforms.✓
- 7.3 Excessive sub-carrier dot pattern: If the notch filter is incorrectly adjusted below 4,43MHz a subcarrier dot pattern will be visible.✓ The correct turning point for the notch filter can easily be found during a colour transmission by adjusting the tuning core until the dot- pattern disappears from the screen.✓✓

(3 × 3)

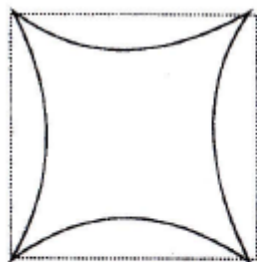
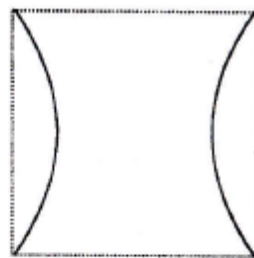
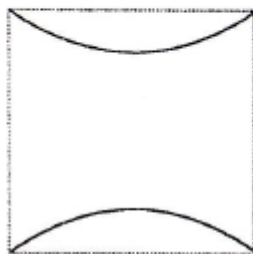
[9]

QUESTION 8

- 8.1 Pincushion distortion: This occurs because the screen is not flat. The distance that the electrons have to travel to the sides, corners✓ and centres respectively are not the same and causes distortion.✓ The picture is stretched in the corners, east/west and north/south.✓

(3)

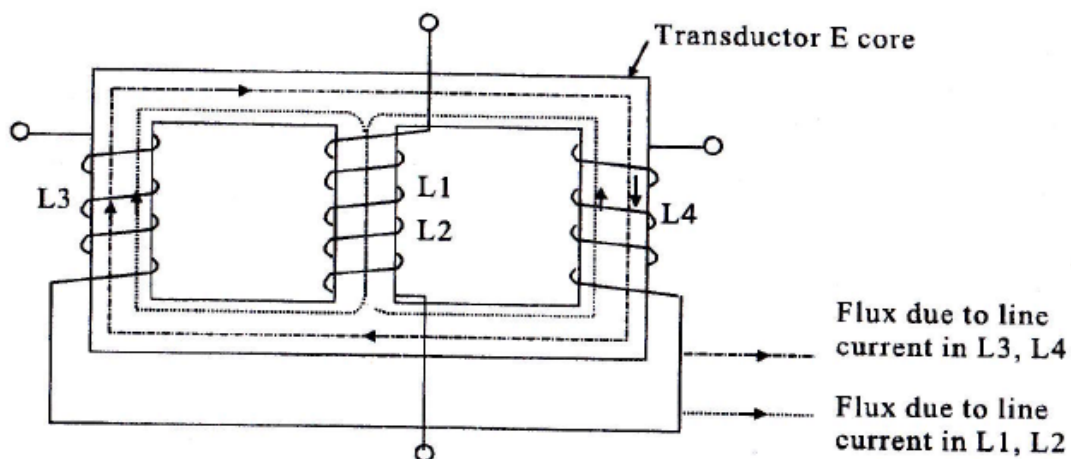
8.2

**Pincushion distortion****East/West distortion****North/South distortion**

(1 mark per each sketch)

(3)

8.3



(½ mark for each label and correct drawing)

(4)

[10]

QUESTION 9

- Use a degaussing coil with a 30 cm diameter with ± 800 to 1 000 ampere turns✓ and fed from a 50 Hz supply.✓
- The coil is held in the hand and moved around the tube supports and face of the tube.✓
- Withdraw slowly and gradually (for about a minute) to about two meters away.✓
- The power supply is then switched off.✓
- Check that the area next to the tube is not near or next to speakers.✓

[6]**QUESTION 10**

- Ensure that the final anode lug is facing the top of the cabinet.
- Place the tube into its position, making sure that the tube is centralised.
- Lightly tighten the retaining screws into place, to hold the tube in its position.
- Replace the earth springs, magnetic shield and support straps and then tighten the nuts.
- Replace the tub neck assembly making sure that the components are lined up correctly.
- Turn the cabinet over to its upright position and replace the chassis.
- Replace the tube base and connect the EHT lead, plugs and sockets in the correct position.
- Degauss the tube and carry out the complete tuning procedure of that particular set.

[8]**QUESTION 11**

- | | | |
|------|--------|--|
| 11.1 | 11.1.1 | <ul style="list-style-type: none"> • Luminance delay line – open circuit✓ • Instrument – oscilloscope✓ |
| | 11.1.2 | <ul style="list-style-type: none"> • Notch filter✓ • Instrument – signal generator✓ |
| | 11.1.3 | <ul style="list-style-type: none"> • EHT stabiliser✓ • Instrument – EHT probe✓ |

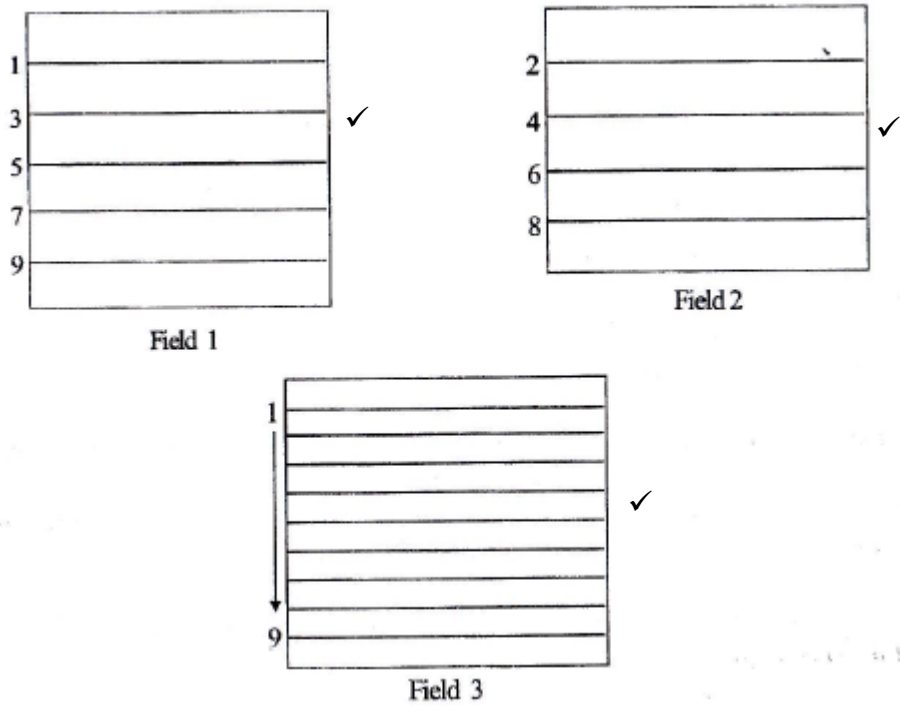
(3 × 2)**(6)**

- | | |
|------|--|
| 11.2 | <p>Line oscillator provides horizontal scanning of the screen with an electron beam.✓ The frequency is 15 625 Hz.✓</p> <p>Field oscillator provides the vertical deflection for scanning the beam.✓ The frequency is 50 Hz.✓</p> |
|------|--|

(4)**[10]**

QUESTION 12

- 12.1 First the beam scans the odd-numbered lines from top to bottom.✓
Then even-numbered lines down to the end of the penultimate line of the raster.✓
From there it fly-backs to the beginning of line 1 and the process is repeated.✓



- 12.2 The purpose of the output stage is to produce the necessary line/horizontal scanning of the screen by the electron beam.

(6)

(2)

[8]

TOTAL SECTION B: 75
GRAND TOTAL: 100