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.**

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## 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**



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## SECTION B

## QUESTION 5

5.1 5.1.1 0,89 V + 0,7 V ✓= 1,59 V ✓

5.1.2 1 V – 0,41 V ✓= 0,59 V ✓

5.1.3 1 V – 0,89 V ✓ = 0,11 V ✓

5.1.4 0,59 V + 0,11 V ✓ = 0,7 V ✓

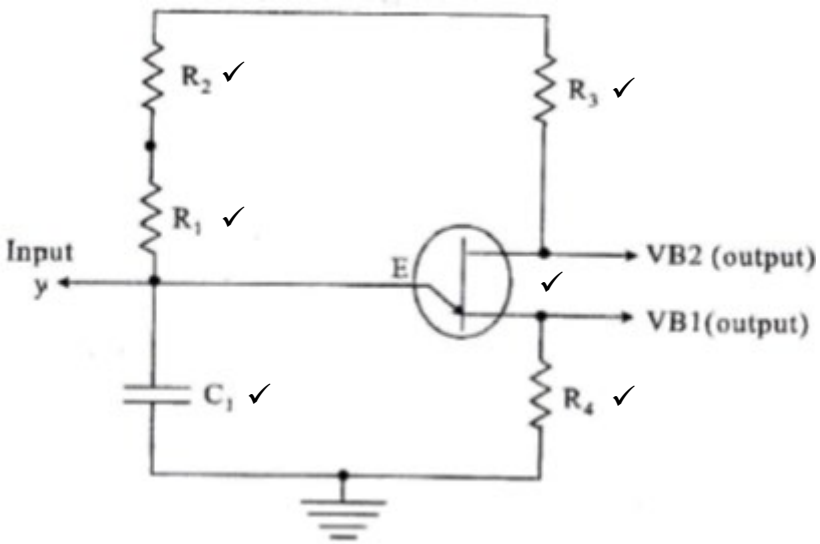
(4 × 2) (8)

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



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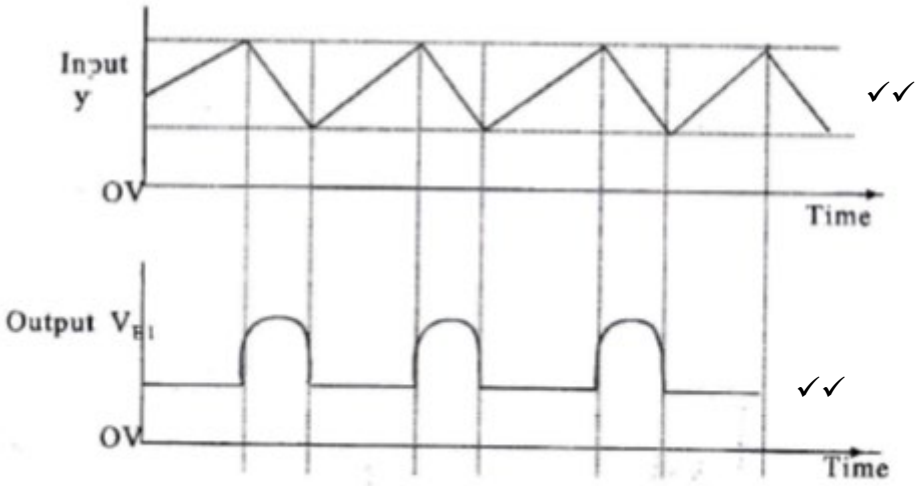


✓✓

✓✓

**[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]**



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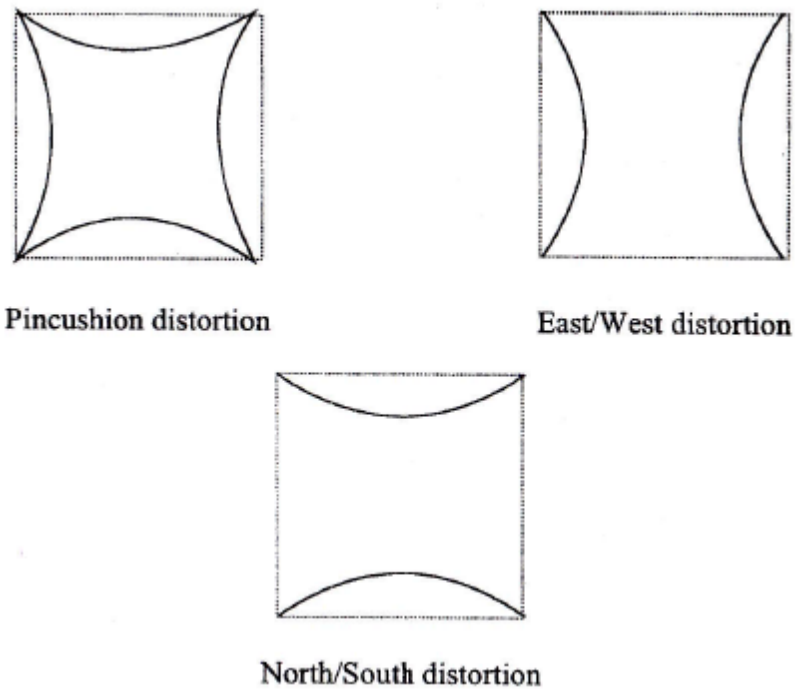
## QUESTION 8

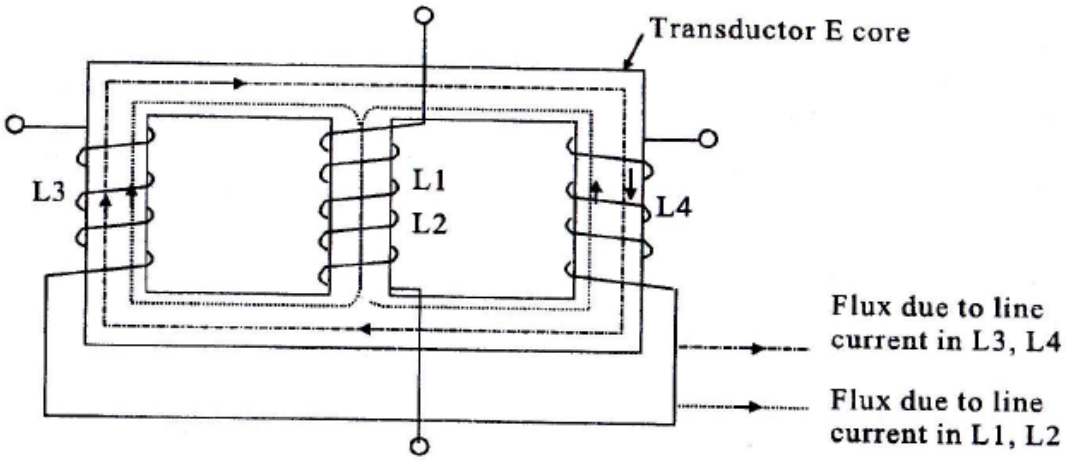
8.1 Pincushion distortion: This occurs because the screen is not flat. The distance that the electrons have to travel to the sides, corners✓ and centres respectively are not the same and causes distortion.✓ The picture is stretched in the corners, east/west and north/south.✓ (3)

8.2




(1 mark per each sketch) (3)

8.3




(½ mark for each label and correct drawing) (4)
**[10]**



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## 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
- Luminance delay line – open circuit✓
- Instrument – oscilloscope✓

11.1.2
- Notch filter✓
- Instrument – signal generator✓

11.1.3
- EHT stabiliser✓
- Instrument – EHT probe✓

(3 × 2) (6)

11.2 Line oscillator provides horizontal scanning of the screen with an electron beam.✓The frequency is 15 625 Hz.✓
Field oscillator provides the vertical deflection for scanning the beam.✓ The frequency is 50 Hz.✓ (4)

**[10]**



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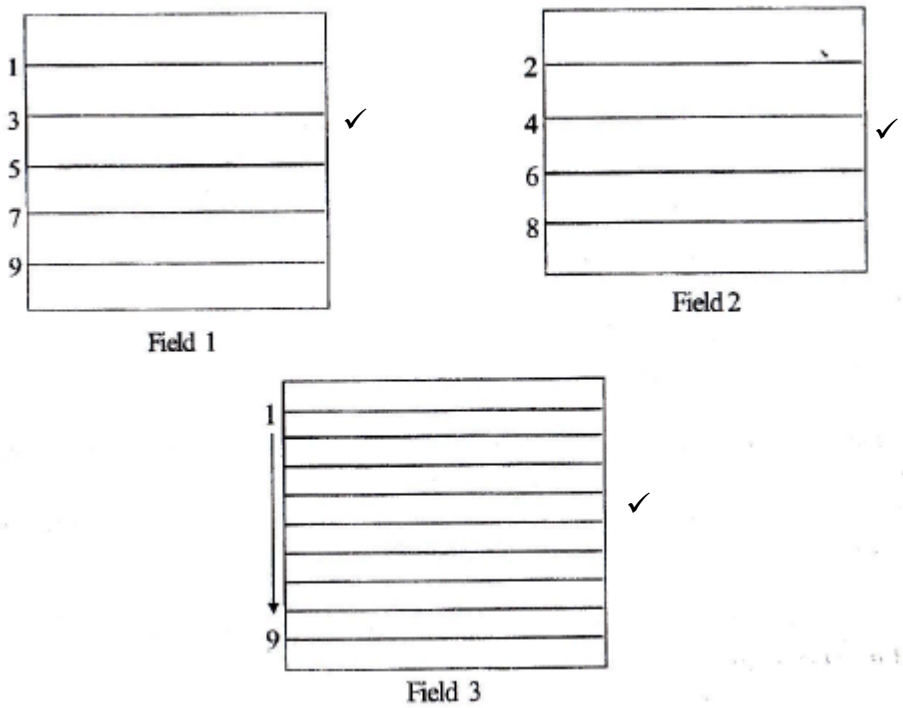
**QUESTION 12**

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.✓




(6)

12.2 The purpose of the output stage is to produce the necessary line/horizontal scanning of the screen by the electron beam. (2)
**[8]**

**TOTAL SECTION B: 75**
**GRAND TOTAL: 100**

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