higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

RADIO AND TELEVISION THEORY N1

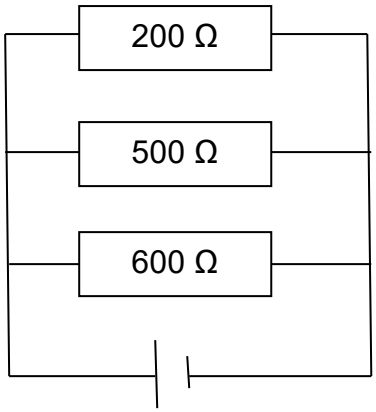
5 AUGUST 2019

This marking guideline consists of 5 pages.

Copyright reserved

QUESTION 1

1.1



(2)

1.2 1.2.1 $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$✓

$\frac{1}{R_T} = \frac{1}{200} + \frac{1}{500} + \frac{1}{600}$✓

$\frac{1}{R_T} = 5 \times 10^{-3} + 2 \times 10^{-3} + 1{,}667 \times 10^{-3}$

$R_T = \frac{1}{8{,}667 \times 10^{-3}}$✓

$R_T = 115{,}380\ \Omega$✓ (4)

1.2.2 $I_T = \frac{V_T}{R_T}$

$= \frac{12}{115{,}380}$✓

$= 0{,}104\ \text{A}$✓ (2)

1.2.3 $I_{R_1} = \frac{12}{200}$✓

$= 0{,}06\ \text{A}$✓ (2)

1.2.4 $V_T = V_{R_2} = 12\ \text{V}$✓✓ (parallel to V_T) (2)

[12]

QUESTION 2

2.1 Video amps are amplifiers used to drive the cathodes of a CRT.

2.2 AGC maintains a relatively constant picture under varying reception conditions.

2.3 Peak white is the maximum brightness when the three guns are driven at the highest level.

2.4 Phosphor refers to the coating inside the monochrome tube to emit light when the beam strikes them.

2.5 Line of sight is the transmission in a straight or direct line between the transmitter and receiver.

(5 × 2) **[10]**

QUESTION 3

- Cathode-ray tube to display picture
- Power supply to feed circuit with voltage and current
- Signal-processing circuits to produce video, sound and sync pulses
- Scanning circuits to generate line and field waveforms
- Loudspeaker to generate sound (5 × 2) **[10]**

QUESTION 4

4.1
- Measures frequency
- Measures DC voltages
- Measures AC voltages
- Measures time or period
- Measures phase differences (5)

4.2 4.2.1 R_1 and R_2 form a voltage divider to provide base voltage to bias the transistor

4.2.2 Coupling capacitor for input signal and stops DC passes AC

4.2.3 Coupling capacitor for output signal and stops DC passes AC

4.2.4 Prevents thermal runaway

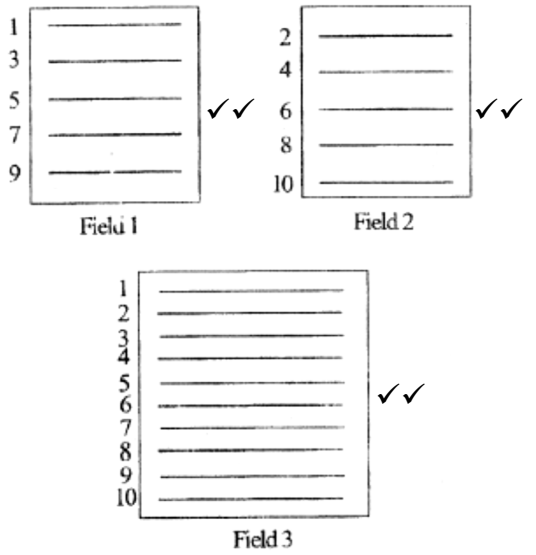
4.2.5 Limits current (load resistor)

(5 × 2) (10)
[15]

Copyright reserved

QUESTION 5

The TV is scanned in consecutive lines. The beam is made to scan all the odd-numbered lines in the order 1, 3, 5, 7, etc. down to the bottom line.✓✓ It then scans all the even lines 2, 4, 6, 8, etc. down to the end line of the raster.✓✓ From there it goes back to the beginning of line 1 and the process is repeated.✓✓



✓✓ ✓✓ ✓✓

[12]

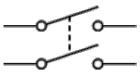
QUESTION 6

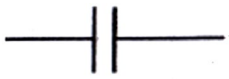
- Very high sensitivity over the full range
- Provides autoranging facility
- More robust against mechanical shock
- Immediate reading – no interpolation of scale needed
- Indicates overload
- No parallax error
- Compensates for reversal of leads (7 × 2) **[14]**

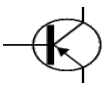
QUESTION 7

7.1 

7.2 

7.3 

7.4 

7.5 

(5 × 1) **[5]**

QUESTION 8

8.1 False
8.2 True
8.3 True

(3 × 1) **[3]**

QUESTION 9

9.1 No picture, a dim picture, bad focus, no brightness

9.2 No picture, no sound

9.3 Dead set, no sound, no pictures

9.4 No horizontal hold, poor line hold, no EHT

9.5 Poor line hold, picture rolls vertically

(5 × 2) **[10]**

QUESTION 10

10.1 High frequency is 3–30 MHz for moderate to long-distance communication

10.2 Very high frequency is 30–300 MHz for radio, navigation, TV and FM

10.3 Ultrahigh frequency is 300–3 000 MHz for short-distance communication, radar and microwave relays

10.4 Medium frequency is 300–3 000 kHz for broadcasting and marine communication

(4 × 2) **[8]**

QUESTION 11

- Plasma
- LCD
- LED

(Any 1 × 1) **[1]**

TOTAL: 100

Copyright reserved