higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1470**(E)**(A5)T

NATIONAL CERTIFICATE

RADIO AND TELEVISION THEORY N1

(11040821)

5 August 2019 (X-Paper)
09:00–12:00

Scientific calculators may be used.

This question paper consists of 6 pages and 1 formula sheet.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
RADIO AND TELEVISION THEORY N1
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Sketches must be neat, clear and fully labelled.
5. Write neatly and legibly.

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QUESTION 1

A circuit consists of THREE resistors connected in parallel. The resistors are supplied by a 12-volt battery and have values of 200 ohms (R_1), 500 ohms (R_2) and 600 ohms (R_3).

1.1 Draw the circuit diagram mentioned above. (2)

1.2 Calculate the:

1.2.1 Total resistance (4)

1.2.2 Total current of the circuit (2)

1.2.3 Current flowing through R_1 (2)

1.2.4 Voltage drop across R_2 (2)

[12]

QUESTION 2

Define each of the following terms:

2.1 Video amp

2.2 AGC

2.3 Peak white

2.4 Phosphor

2.5 Line of sight

(5 × 2) **[10]**

QUESTION 3

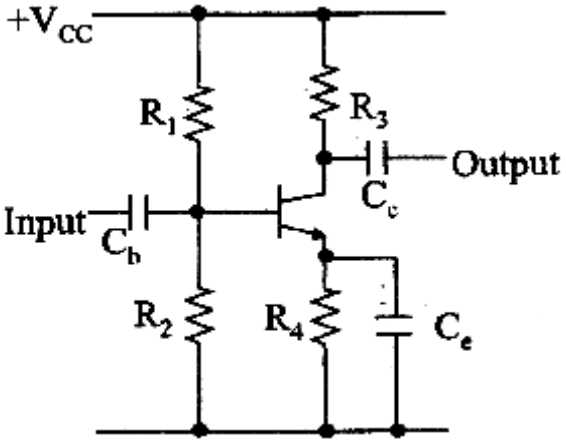
Name the FIVE basic elements that make up a 625-line monochrome television receiver and give the function of each. (5 × 2) **[10]**

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QUESTION 4

4.1 State FIVE uses of an oscilloscope. (5)

4.2



Give the function of each of the following components represented in the circuit above:

4.2.1 R_1 and R_2

4.2.2 C_b

4.2.3 C_c

4.2.4 R_4

4.2.5 R_3

(5 × 2) (10)
[15]

QUESTION 5

Explain, by means of a sketch, the interlaced line-scanning process of a picture of a TV. **[12]**

QUESTION 6

Give SEVEN advantages of a digital multimeter. (7 × 2) **[14]**

QUESTION 7

Draw each of the following electronic components:

7.1 LED

7.2 Diode

7.3 Double-pole single-throw switch

7.4 Fixed capacitor

7.5 PNP transistor

(5 × 1) **[5]**

QUESTION 8

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (8.1–8.3) in the ANSWER BOOK.

8.1 Analogue multimeters are more accurate than digital meters.

8.2 The CRT of a colour TV has three electronic beams.

8.3 Aquadag is coated in the CRT of a black and white TV.

(3 × 1) **[3]**

QUESTION 9

Name TWO faults in each of the following stages that can be diagnosed by a TV technician:

9.1 Cathode-ray tube

9.2 Line output

9.3 Power supply

9.4 Line oscillator

9.5 Sync separator

(5 × 2) **[10]**

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QUESTION 10

Give the frequency range and ONE application of each of the following frequencies used in radio communication:

10.1 High frequency

10.2 Very high frequency

10.3 Ultrahigh frequency

10.4 Medium frequency

(4 × 2) **[8]**

QUESTION 11

Name ONE type of modern flat-screen TV. **[1]**

TOTAL: 100

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FORMULA SHEET

$V = 3 \times 10^8 m/s$

$m\% = \frac{A-B}{A+B} \times \frac{100}{1}$

$R_T = R_1 + R_2 + \cdots R_N$

$e = E_M sin2\pi ft$

$P = V \times I$

$emf = {}^{b}/_{v}$

$V = \frac{P}{I}$

$I = \sqrt{\frac{P}{R}}$

$F = \frac{1}{T}$

$c = r \times t$

$I = \frac{E}{R+r}$

$\lambda = \frac{V}{f}$

$P = I^2 R$

$I = I_M sin2\pi ft$

$R = \frac{P}{I^2}$

$V = I \times R$

$R = \frac{V^2}{P}$

$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \cdots \frac{1}{R_N}$

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