higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1490**(E)**(A5)T

NATIONAL CERTIFICATE

RADIO AND TELEVISION THEORY N3

(11040843)

5 August 2019 (X-Paper)
09:00–12:00

Scientific calculators may be used.

This question paper consists of 5 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
RADIO AND TELEVISION THEORY N3
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. Subsections of questions may NOT be separated.
5. Sketches must be neat.
6. Write neatly and legibly.

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QUESTION 1

1.1 Name and explain THREE properties of colour. (9)

1.2 Give the voltage value of the colour magenta. (1)

[10]

QUESTION 2

Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–K) next to the question number (2.1–2.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
2.1	Mixer	A	refraction of waves
2.2	Degaussing	B	antenna
2.3	50 Hz scanning	C	shadow mask
2.4	EHT generator	D	Zener diode
2.5	Dipole	E	demagnetising
2.6	LED	F	colour intensity
2.7	Voltage regulator	G	indicator
2.8	CRT	H	LOPT
2.9	Hue	I	alternating current
2.10	Ionosphere	J	vertical oscillator
		K	heterodyne

(10 × 1) **[10]**

QUESTION 3

Explain each of the following terms regarding chrominance circuits:

3.1 Notch filter (4)

3.2 Colour killer (3)

[7]

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QUESTION 4

Choose the correct option from those given in brackets. Write only the option next to the question number (4.1–4.5) in the ANSWER BOOK.

4.1 The (additive/subtractive) colour-mixing process is used in photography.

4.2 Materials, of which the resistance changes when light fall on them, are known as (photoe-missive/photoconductive).

4.3 The tuner used in monochrome and colour television receivers is (the same/not the same).

4.4 The television tube makes use of (line-by-line/interlaced) scanning.

4.5 The horizontal scanning frequency is (50/15 625/17 625) Hz.

(5 × 1) **[5]**

QUESTION 5

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (5.1–5.5) in the ANSWER BOOK.

5.1 The monochrome and colour television receivers use the same luminance amplifiers.

5.2 The notch filter is used in a monochrome television receiver.

5.3 Dark current refers to a current that flows in a television camera tube when light shines on it.

5.4 Flash-overs are caused by high EHT.

5.5 Heterodyning is the process of beating two frequencies together to produce sum and difference frequencies.

(5 × 1) **[5]**

QUESTION 6

Draw a detailed, labelled block diagram of colour TV receiver. All interconnections must be shown. **[20]**

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QUESTION 7

7.1 Explain the TWO methods of how to generate EHT in a TV receiver. (2 × 2) (4)

7.2 Make a labelled sketch of a basic extra high tension tripler circuit. (8)
[12]

QUESTION 8

8.1 Make a drawing of each of the following waveforms used in oscillators:

8.1.1 Sine wave

8.1.2 Square wave

8.1.3 Sawtooth wave

(3 × 2) (6)

8.2 Define each of the following terms used in radio-wave propagation:

8.2.1 Polarisation

8.2.2 Ground wave

8.2.3 Direct wave

(3 × 2) (6)
[12]

QUESTION 9

The oscilloscope is widely used to repair monochrome television sets.

9.1 Name FIVE measurements that can be done with an oscilloscope. (5)

9.2 Name the components of a monochrome television tube. (10)
[15]

QUESTION 10

Define each of the following CRT components:

10.1 Electron gun

10.2 Control grid

(2 × 2) **[4]**

TOTAL: 100

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