higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

RADIO AND TELEVISION THEORY N3

(11040843)

14 April 2021 (X-paper)
09:00–12:00

Scientific calculators may be used.

This question paper consists of 6 pages.

169Q1A2114

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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. Start each section on a new page.
5. Use only a blue or black pen.
6. Write neatly and legibly.

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QUESTION 1

Various options are given as possible answers to the following questions. Choose the correct answer and write only the letter (A–D) next to the question number (1.1–1.5) in the ANSWER BOOK.

1.1 Magenta contains no … colour

A green
B red
C blue
D white

1.2 PN diodes also function as … in power supplies.

A regulators
B bidirectionals
C amplifiers
D rectifiers

1.3 The tripler circuit in colour receivers supplies …

A ±12 V
B ±15 kV
C ± 33 V
D ± 25 kV

1.4 TV aerials are based on a … dipole

A two-wave
B three-wave
C half-wave
D four wave

1.5 Cyan contains no … colour

A blue
B green
C red
D yellow

(5 × 1) **[5]**

QUESTION 2

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (2.1–2.5) in the ANSWER BOOK.

2.1 White is an additive colour from three primary colours.

2.2 EMF exists around the charged battery voltage.

2.3 Radio and TV involves transmission of electromagnetic waves.

2.4 Radio waves can be distorted by lightning.

2.5 Detectors are mostly used to recover original intelligence.

(5 × 1) **[5]**

QUESTION 3

Choose a term from COLUMN B that matches a description in COLUMN A. Write only the letter (A–L) next to the question number (3.1–3.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
3.1	Demagnetises the shadow-mask	A	colour
3.2	Shows the geometry of the picture.	B	phosphor
3.3	Used to align I.F stages	C	automatic degaussing
3.4	Signal magnification	D	light
3.5	TV antenna	E	heterodyne
3.6	UJT	F	zener diode
3.7	Emits electrons	G	Rectifier
3.8	Hue	H	aerial
3.9	Mixer	I	amplifiers
3.10	Electromagnetic radiation	J	sweep generators
		K	relaxation oscillator
		L	the cross-hatch pattern

(10 × 1) **[10]**

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QUESTION 4

4.1 Given the secondary colours below, by means of additive colour mixing process, give the primary colours and voltages to indicate the resulted colours below.

4.1.1 Yellow

4.1.2 Magenta

4.1.3 Cyan

(3 × 3) (9)

4.2 What is the voltage value of white? (1)

[10]

QUESTION 5

Explain the function of the following television receiver stages:

5.1 AGC

5.2 Video amp

5.3 Tuner (front-end)

5.4 Sync separator

5.5 The line oscillator

(5 × 2) **[10]**

QUESTION 6

6.1 Name the faulty section and the test instrument to use for the following television receiver faults:

6.1.1 Only colour and no picture information on the screen with the incoming correct signal. (2)

6.1.2 A dot pattern is displayed on the screen of a colour television receiver. (2)

6.1.3 The EHT is unstable in a colour television receiver. (2)

6.2 List THREE functions that must be fulfilled by the line output stage in a receiver. (3)

[9]

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QUESTION 7

7.1 The notch filter circuit is very important in colour television receiver.

Describe its purpose in the colour receiver stages. (4)

7.2 Draw a labelled circuit of the typical notch filter including the response curve of the circuit. (7)
[11]

QUESTION 8

8.1 List factors to be considered when building and or designing the antenna for a specific task. (5)

8.2 Draw a block diagram of a stabilised power supply using safety trips. (7)
[12]

QUESTION 9

9.1 Make a fully labelled sketch of an IF response curve for a colour television receiver. (8)

9.2 Name the THREE most important frequencies in the IF response curve referred to in QUESTION 9.1. (3)
[11]

QUESTION 10

10.1 List FIVE test equipment used in electronic television repair workshop (5)

10.2 Explain how to correct pincushion distortion in colour televisions. (2)
[7]

QUESTION 11

11.1 Draw a neat, labelled sketch of the plumbicon camera tube. (8)

11.2 Give reasons for using flywheel synchronisation in the horizontal scanning circuits of a television receiver. (2)
[10]

TOTAL: 100

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