higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

RADIO AND TELEVISION THEORY N3

(11040843)

8 April 2020 (X-paper)
09:00–12:00

Calculators may be used.

This question paper consists of 6 pages.

169Q1A2008

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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. 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 Used for voltage regulation in a circuit:

A Resistor
B Transistor
C Zener diode
D Capacitor

1.2 Offers high resistance to AC current:

A Inductor
B Capacitor
C Resistor
D Diode

1.3 Referring to amount of colour:

A Hue
B Magenta
C Red
D Blue

1.4 Detects the amplitude modulation:

A Detector
B AM detector
C FM detector
D Superimposing

1.5 Atom which gains an electron:

A Negative ion
B Positive ion
C Neutral ion
D Lost ion

(5 × 1) **[5]**

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QUESTION 2

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

2.1 A diode directs current in two directions.

2.2 A transistor can also be used to filter frequency.

2.3 A capacitor offers high resistance at low frequency.

2.4 Resistors are semiconductors in electronic circuits.

2.5 A shadow mask is a television tube.

(5 × 1) **[5]**

QUESTION 3

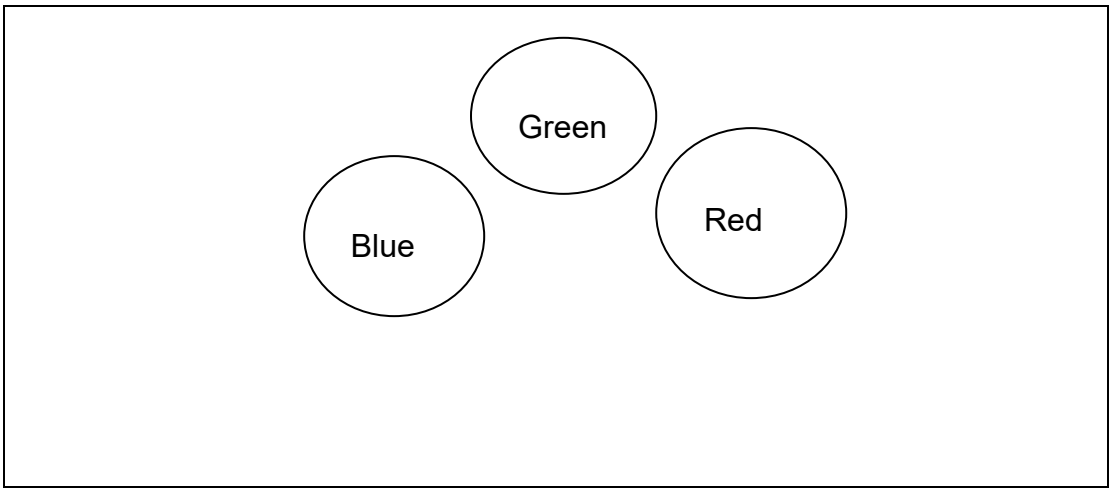
Choose a term from COLUMN B that matches a term in COLUMN A. Write only the letter (A–L) next to the question number (3.1–3.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
3.1	Super heterodyne	A	CRT
3.2	Ionosphere	B	semiconductor
3.3	Shadow mask	C	indicator
3.4	Diode	D	antenna
3.5	Transistor	E	mixing
3.6	Led	F	wave refraction
3.7	Dipole	G	switch
3.8	15625 Hz	H	separating waveform
3.9	Detection	I	line oscillator
3.10	Valence atom	J	silicon atom
		K	hue
		L	vertical oscillator

(10 × 1) **[10]**

QUESTION 4

4.1 Use the sketch below to draw the additive colour mixing process in the ANSWER BOOK by combining the circles to make complementary colours. Indicate the complementary colours



(7)

4.2 Discuss the THREE properties of colour that can be seen on television. (6)

[13]

QUESTION 5

Explain each of the following colour television components and stages:

5.1 Video detector

5.2 Video amplifier

5.3 IF amplifier

5.4 Limiter stage

5.5 Audio amplifier

(5 × 2) **[10]**

QUESTION 6

Explain the steps in purity adjustment. **[7]**

QUESTION 7

7.1 How is automatic degaussing obtained in a colour receiver set? (10)

7.2 Which TWO factors must be considered when designing IF amplifiers? (4)

[14]

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QUESTION 8

8.1 Name FIVE advantages of a LOG periodic antenna. **[5]**

QUESTION 9

9.1 Draw a labelled sketch of a CHOPPER power supply. **[7]**

QUESTION 10

10.1 Draw a labelled waveform of a horizontal line used in a 625 line colour television. (9)

10.2 Define each of the following camera tube terms:

10.2.1 Photocathode

10.2.2 Secondary electrons

10.2.3 Wire mesh

(3 × 2) (6)
[15]

QUESTION 11

Give the frequencies in the IF amplifiers for each of the following signals:

11.1 Lower rejection point

11.2 Sound IF

11.3 Chrominance IF

11.4 Luminance IF

(4 × 1) **[4]**

QUESTION 12

Draw a labelled circuit diagram of an auto-degaussing circuit and current in the coils of a colour receiver. **[5]**

TOTAL: 100

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