higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

RADIO AND TELEVISION THEORY N1

3 August 2021

This marking guideline consists of 7 pages.

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INSTRUCTIONS TO MARKERS

1. Mark all the questions.
2. Follow the answers according to the numbering system used in this question paper.
3. Only use a red pen.
4. Make your ticks and crosses neatly and legibly.

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QUESTION 1

1.1 D
1.2 B
1.3 D
1.4 B
1.5 D

(5 × 1) **[5]**

QUESTION 2

2.1 False
2.2 False
2.3 True
2.4 True
2.5 True

(5 × 1) **[5]**

QUESTION 3

3.1 H
3.2 I
3.3 G
3.4 F
3.5 A
3.6 B
3.7 E
3.8 D
3.9 C
3.10 J

(10 × 1) **[10]**

QUESTION 4

4.1 $R_T = \frac{R_1 \times R_2}{R_1 + R_2} + R_3$ ✓

$= \frac{5 \times 15}{5+15} + 25$ ✓

= 28.75 Ω ✓✓ (4)

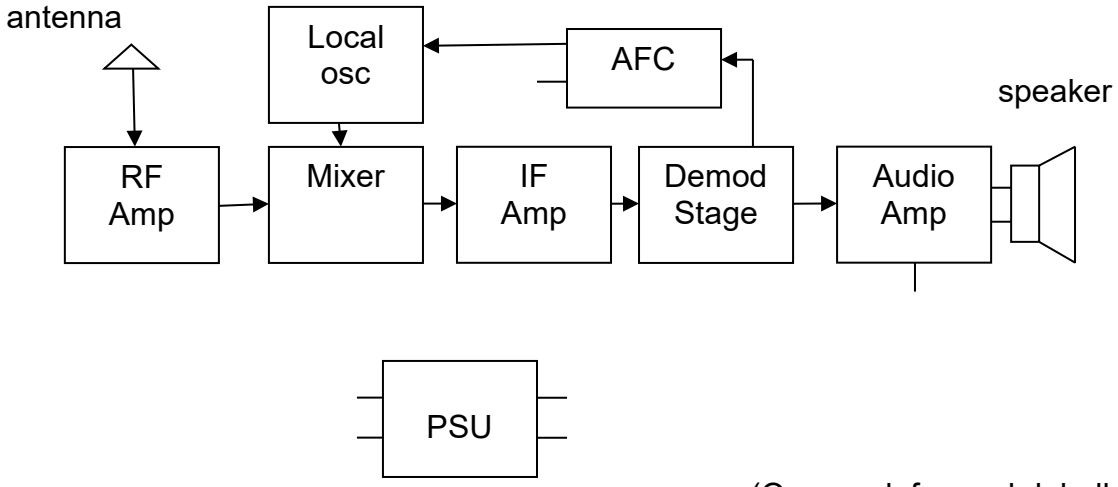
4.2 $I_T = \frac{V_T}{R_T}$

$= \frac{12}{28.75}$ ✓

= 0.417 A ✓✓ (3)

4.3 V = $I_T \times R_{25}$
= 0.417 × 25✓
= 10.425 V✓✓ (3)
[10]

QUESTION 5



(One mark for each labelled block) **[11]**

QUESTION 6

6.1 Electromagnetic induction is defined as induction between a coil and a magnet.

6.2 Self-induction occurs when a piece of wire (conductor) is connected in a circuit, current flows and magnetic field is created around the piece of wire.

6.3 Faraday's law states that when a conductor moves through a magnetic field, a voltage and a current will be induced in the conductor.

6.4 Lenz's law states that the direction of the induced current is such that its own magnetic field opposes the action that produced the induced current. That is the reason why a coil offers resistance against AC.

6.5 A cycle is defined as that part of a wave between two successive points having the same value and at which the wave is varying in the same direction.

(5 × 2) **[10]**

QUESTION 7

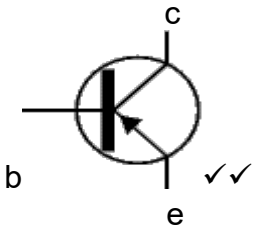
7.1 7.1.1 A diode



✓✓

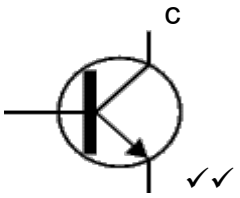
anode cathode

7.1.2 A PNP transistor



✓✓

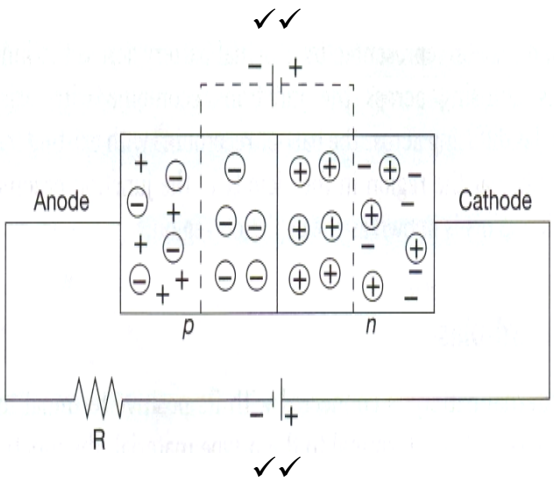
7.1.3 An NPN transistor



✓✓

(3 × 2) (6)

7.2



✓✓ ✓✓

(4)
[10]

QUESTION 8

8.1 The IF amp is responsible for most of the signal gain and it also affects the overall quality of the picture.

8.2 A video detector is a nonlinear device that performs the function of heterodyning the amplified signal from the broadcaster with the local oscillator output signal to give out the three IF signals (i.e. audio, chrominance and luminance).

8.3 The video amp amplifies the picture signal at high peak voltages to drive the cathodes of the CRT.

8.4 The sync separator provides synchronising pulses to the line and field oscillators.

8.5 Peak white is obtained when all three guns (red, green and blue) are driven to their maximum output.

(5 × 2) **[10]**

QUESTION 9

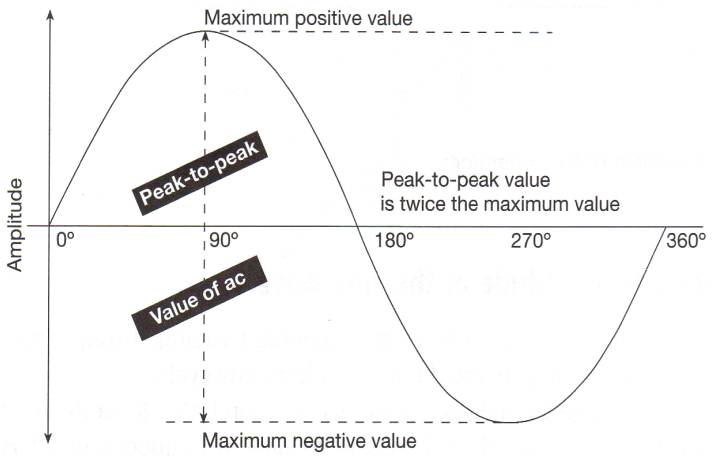
9.1
- The area of the plates
- The distance between the plates
- The type of dielectric material used between the plates (3 × 2) (6)

9.2
- The type of material
- The length of the wire
- The area of the wire (3 × 2) (6)

[12]

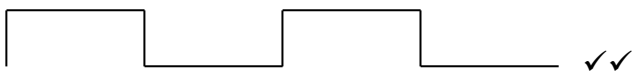
QUESTION 10

10.1 10.1.1



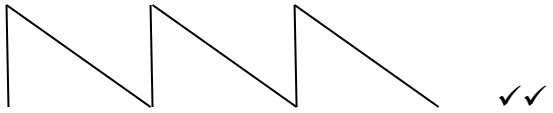
✓✓

10.1.2



✓✓

10.1.3



✓✓

(3 × 2) (6)

10.2 10.2.1 Polarisation: the electric field of an aerial is parallel to the length of the aerial, and the magnetic field is at a right angle to it.

10.2.2 Ground waves travel from the transmitting aerial to earth and follow the curvature of the earth to the receiver.

10.2.3 Direct waves travel directly in an almost straight line from the transmitter to the receiver.

(3 × 2) (6)
[12]

QUESTION 11

11.1 Intermediate frequency
11.2 Audio frequency
11.3 High definition
11.4 Frequency modulation
11.5 Amplitude modulation

(5 × 1) **[5]**

TOTAL: 100

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