



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

RADIO AND TELEVISION THEORY N2

1 AUGUST 2018

This marking guideline consists of 6 pages.

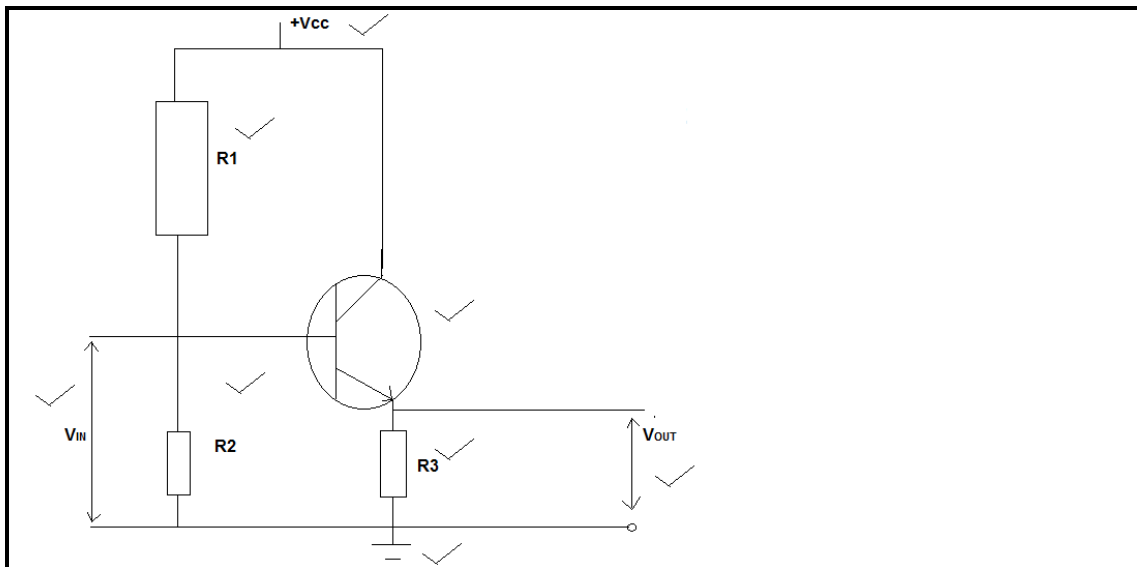
QUESTION 1

- 1.1 E
- 1.2 J
- 1.3 G
- 1.4 H
- 1.5 A
- 1.6 B
- 1.7 C
- 1.8 D
- 1.9 F
- 1.10 I

(10 × 1) [10]

QUESTION 2

2.1



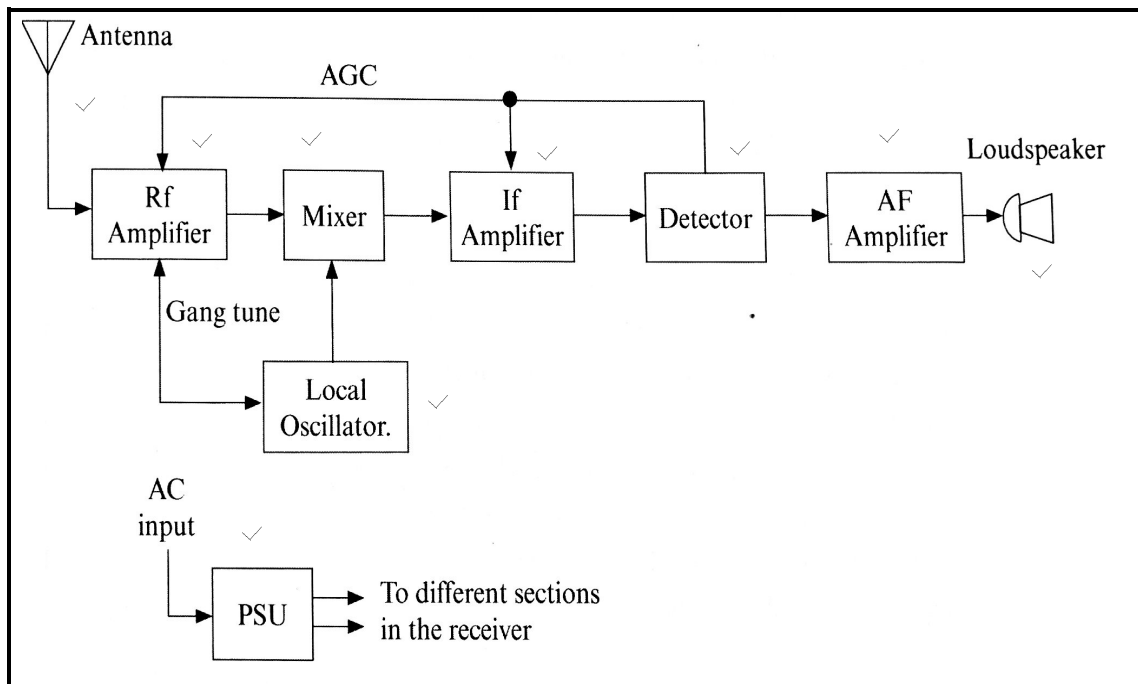
(8)

- 2.2
 - 2.2.1 current gain – high
 - 2.2.2 voltage gain –unity or less than
 - 2.2.3 power gain – medium
 - 2.2.4 input impedance – high

(4 × 1) (4)

QUESTION 3

3.1



(10)

3.2 1000 KHz;✓ 1455 KHz;✓ 455 KHz;✓ 2455 KHz✓ (4)

- 3.3
- The length of the aerial will be too great.
 - Only one station can be transmitted at a time.
 - Stations operating at these frequencies are inefficient.
 - Employing a carrier frequency for the audio information.
- (4)

3.4 The carrier's✓ amplitude is varied in accordance with the amplitude✓ of the modulating signal. (2)
[20]

QUESTION 4

4.1

$$\begin{aligned}
 peak &= \frac{RMS}{0,707} \\
 &= \frac{100}{0,707} \checkmark \\
 &= 141,44V \checkmark
 \end{aligned}$$

4.2

$$\begin{aligned}
 Average &= 0,637 \times peak \\
 &= 0,637 \times 141,44 \checkmark \\
 &= 90,1V \checkmark
 \end{aligned}$$

$$\begin{aligned}
 4.3 \quad Wavelength &= \frac{V}{f} \\
 &= \frac{3 \times 10^8}{50} \checkmark \\
 &= \underline{6 \times 10^6 m} \checkmark
 \end{aligned}$$

$$\begin{aligned}
 4.4 \quad T &= \frac{1}{f} \\
 &= \frac{1}{50} \checkmark \\
 &= \underline{0,02 seconds} \checkmark
 \end{aligned}$$

(4 × 2) [8]

QUESTION 5

$$\begin{aligned}
 5.1 \quad X_L &= X_C \checkmark \\
 Z &= \frac{L}{RC} = \max \checkmark \\
 I &= \min \checkmark \\
 \text{Phase angle} &= 0 \checkmark
 \end{aligned}$$

(4 × 1) (4)

$$\begin{aligned}
 5.2 \quad 5.2.1 \quad fr &= \frac{1}{2\pi\sqrt{LC}} \\
 &= \frac{1}{2\pi\sqrt{10 \times 10^{-3} \times 100 \times 10^{-6}}} \checkmark \checkmark \\
 &= \underline{159,134 Hz} \checkmark
 \end{aligned}$$

(3)

$$\begin{aligned}
 5.2.2 \quad X_L &= 2\pi fL \\
 &= 2\pi 159,134 \times 10 \times 10^{-3} \\
 &= \underline{10 \Omega} \checkmark \\
 \therefore X_L &= X_C \checkmark
 \end{aligned}$$

$$\begin{aligned}
 X_C &= \frac{1}{2\pi fC} \\
 &= \frac{1}{2\pi 159,134 \times 100 \times 10^{-3}} \\
 &= 9,999 \checkmark \\
 &= \underline{10 \Omega} \checkmark
 \end{aligned}$$

(3)
[10]

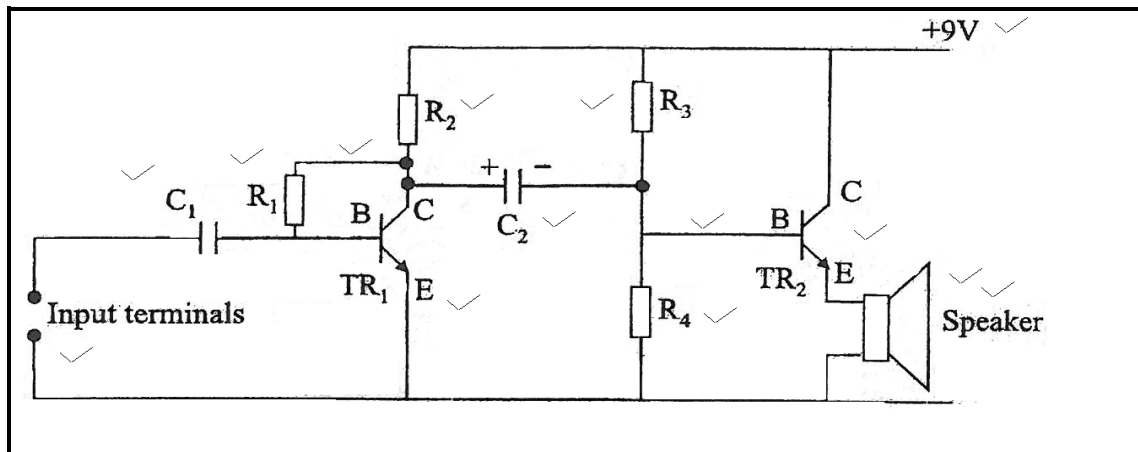
QUESTION 6

- 6.1 6.1.1 To block DC;✓ to pass AC;✓ couples two circuits together.✓ Used to isolate circuits.✓
- 6.1.2 The load is developed across✓ this resistor; supplies:✓ collector voltage, ensures maximum✓ collector current.
- 6.1.3 Main component✓ in an amplifier✓ circuit (Note: does not amplify/only a switch)

(Any 3 × 2)

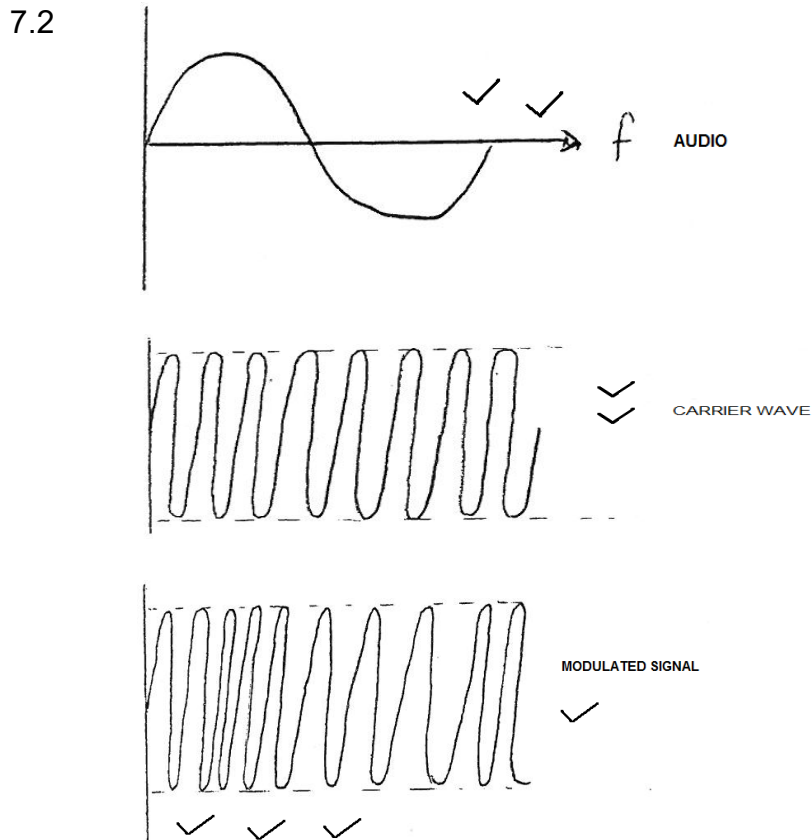
(6)

6.2

(14)
[10]

QUESTION 7

- 7.1 The frequency✓ of the carrier✓ is varied in accordance with the instantaneous✓ value of the amplitude of the modulating signal with the amplitude✓ of the carrier remaining constant. (4)



- 7.3 It filters out the carrier frequency (no information) and retains the audio. (2)
- 7.4 It has its own built in limiter. (2)
- 7.5 It is used to remove noise spikes and amplitude variations. (2)
- 7.6 Foster – Seeley✓ discriminator✓ (2)

[20]**TOTAL: 100**