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.

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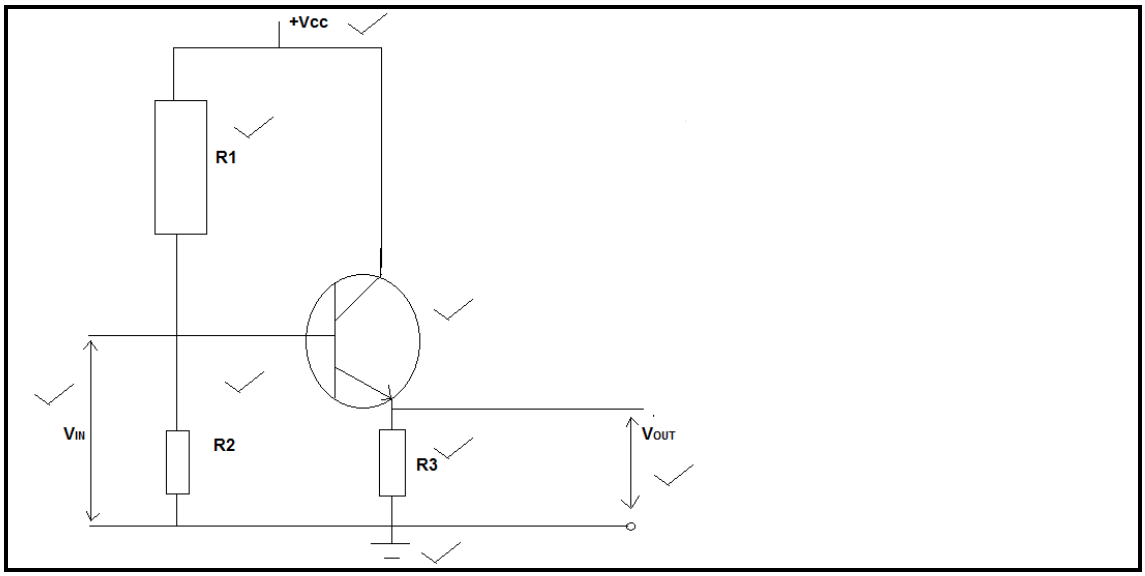
QUESTION 1

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

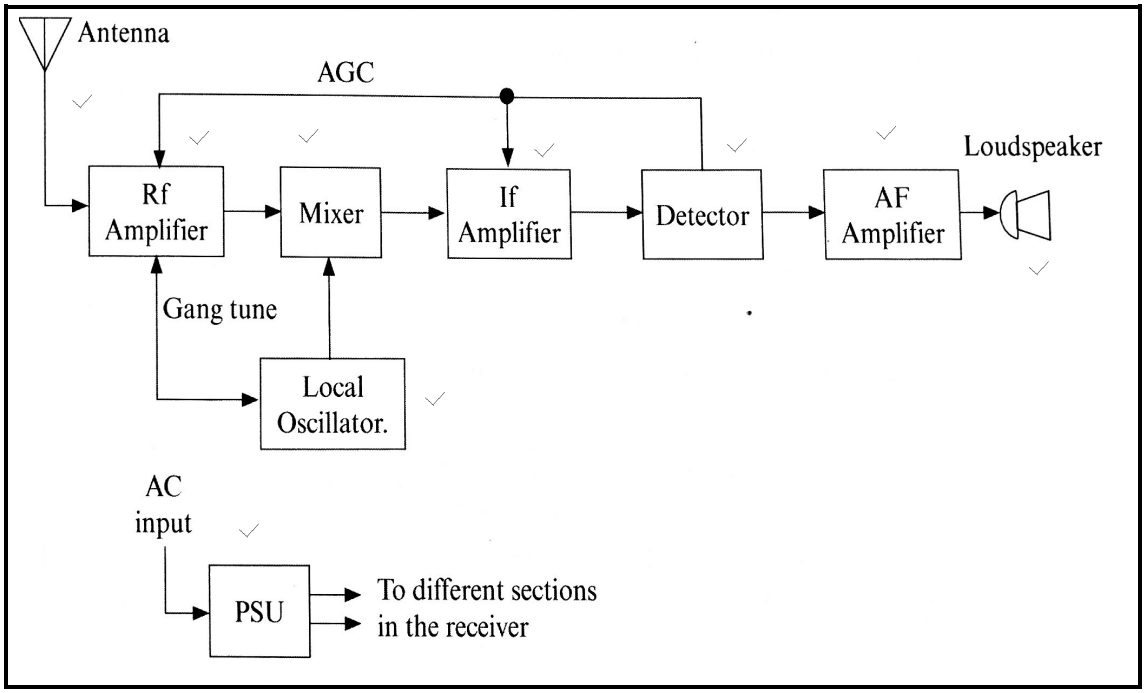
2.2.3 power gain – medium

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
$$peak = \frac{RMS}{0,707}$$
$$= \frac{100}{0,707} \checkmark$$
$$= \underline{141,44V} \checkmark$$

4.2
$$Average = 0,637 \times peak$$
$$= 0,637 \times 141,44 \checkmark$$
$$= \underline{90,1V} \checkmark$$

4.3
$$Wavelenght = \frac{V}{f}$$
$$= \frac{3\times10^{8}}{50} \checkmark$$
$$= \underline{6\times10^{6} m} \checkmark$$

4.4
$$T = \frac{1}{f}$$
$$= \frac{1}{50} \checkmark$$
$$= \underline{0{,}02\,\text{sec}\,onds} \checkmark$$

(4 × 2) **[8]**

QUESTION 5

5.1
$$X_L = X_C \checkmark$$
$$Z = \frac{L}{RC} = \max \checkmark$$
$$I = \min \checkmark$$
Phase angle = 0✓ (4 × 1) (4)

5.2 5.2.1
$$fr = \frac{1}{2\pi\sqrt{LC}}$$
$$= \frac{1}{2\pi\sqrt{10\times10^{-3}\times100\times10^{-6}}} \checkmark\checkmark$$
$$= \underline{159{,}134Hz} \checkmark$$ (3)

5.2.2
$$X_L = 2\pi fL$$
$$= 2\pi 159{,}134\times10\times10^{-3}$$
$$= \underline{10\,\Omega} \checkmark$$

$$X_C = \frac{1}{2\pi fC}$$
$$= \frac{1}{2\pi 159{,}134\times100\times10_{-3}}$$
$$= 9{,}999 \checkmark$$
$$= \underline{10\,\Omega} \checkmark$$

$$\therefore \underline{X_L = X_C}$$ (3)
[10]

QUESTION 6

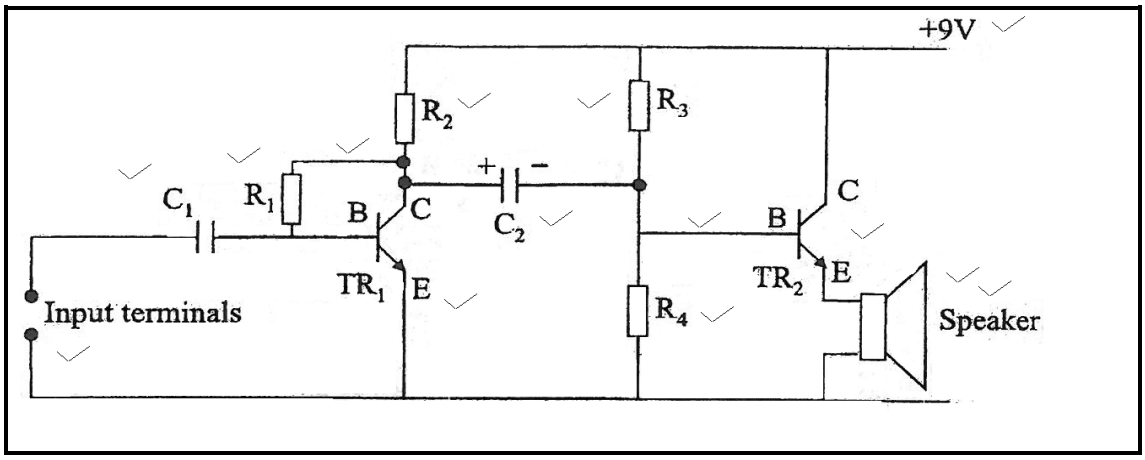
6.1 6.1.1 To block DC;✓ to pass AC;✓couples two circuits together.✓ Used to isolate circuits.✓

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

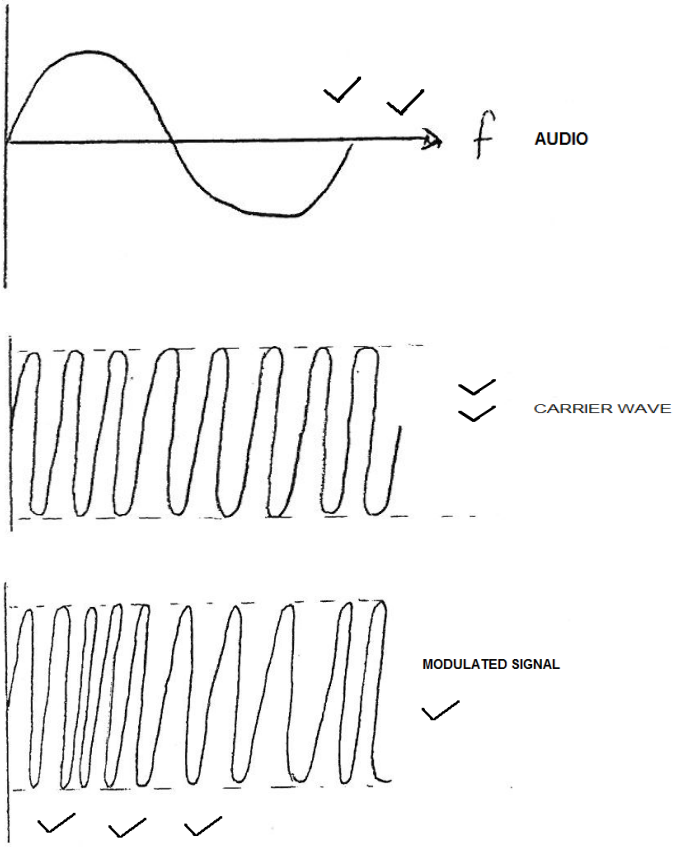


(14)
[10]

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)

7.2



(8)

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

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