higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

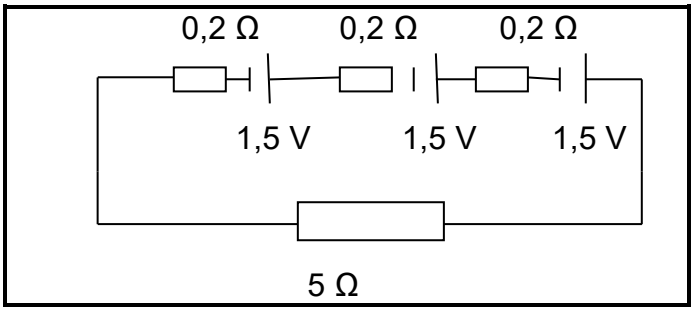
RADIO AND TELEVISION THEORY N1

31 JULY 2018

This marking guideline consists of 6 pages.

QUESTION 1

1.1



(2)

1.2 1.2.1 Emf = 1,5 v × 3✓

= 4,5 V✓

1.2.2 Rin = 0,2 Ω × 3✓

= 0,6 Ω✓

1.2.3 $It = \frac{Emf}{R + Rin}$

$= \frac{4,5}{5 + 0,6}$✓

= 0,804 Ω✓

1.2.4 Voltage drop = It × Rin

= 0,804 × 0,6✓

= 0,482 V✓

(4 × 2) (8)
[10]

QUESTION 2

2.1 $\text{Peak voltage} = \frac{Vrms}{0,707}$

$= \frac{20}{0,707}$✓

= 28,29 V✓

2.2 RMS value = 0,707 × Vp

= 0,707 × 28,29✓

= 20 V✓

2.3 Wavelength $\lambda = \frac{V}{F}$

$= \frac{3 \times 10^8}{50}$✓

$= 6 \times 10^6$ meters✓

2.4 Generation period = $\frac{1}{f}$

$= \frac{1}{50}$✓

= 20 ms✓

2.5 Velocity = frequency × wavelength

= 50 Hz × 6 × 10^6✓

= 3 × 10^8 m/s✓

(5 × 2) **[10]**

QUESTION 3

3.1 10^{-6} f
3.2 10^{-9}f
3.3 10^{-12} f
3.4 1000 nf
3.5 1000 pf

(5 × 1) **[5]**

QUESTION 4

4.1 Automatic gain control

4.2 Automatic frequency control

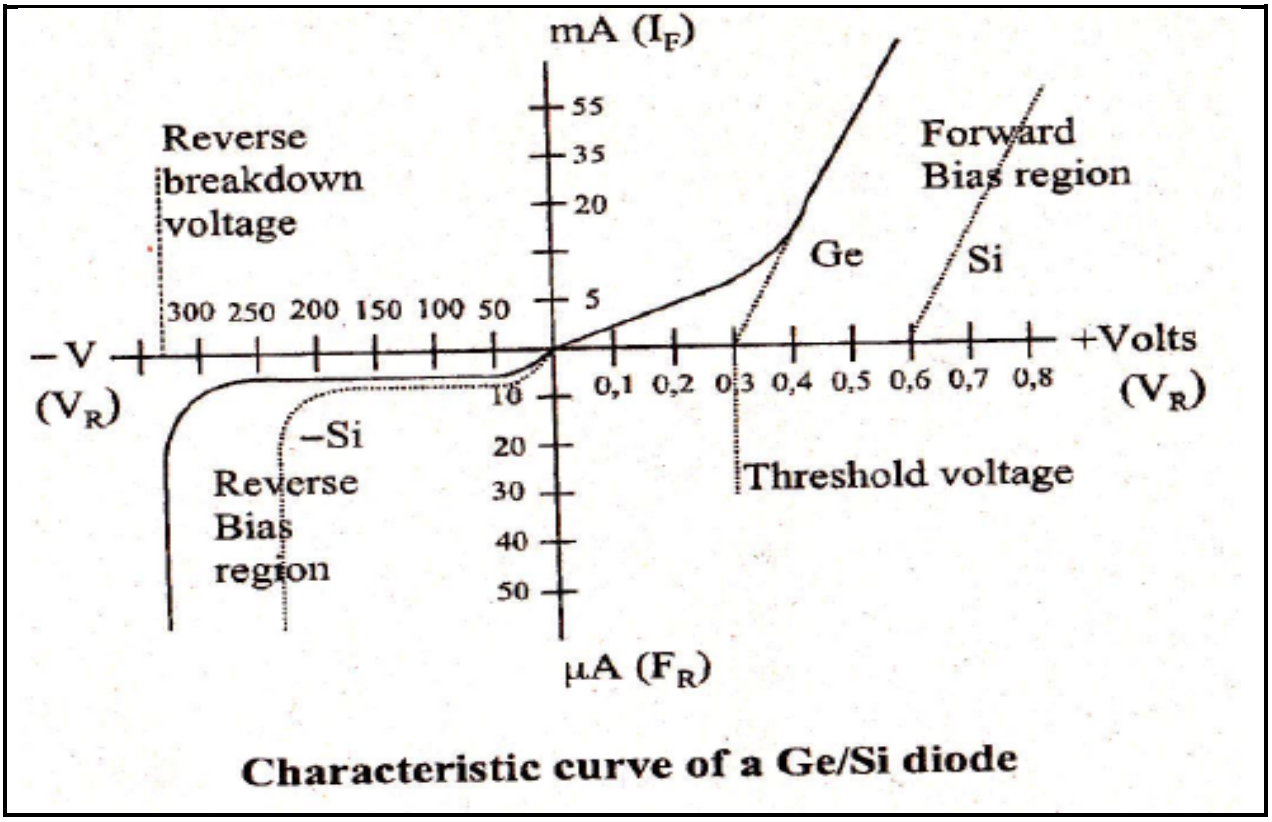
4.3 Very high frequency

4.4 Ultra-high frequency

4.5 Intermediate frequency

(5 × 1) **[5]**

QUESTION 5

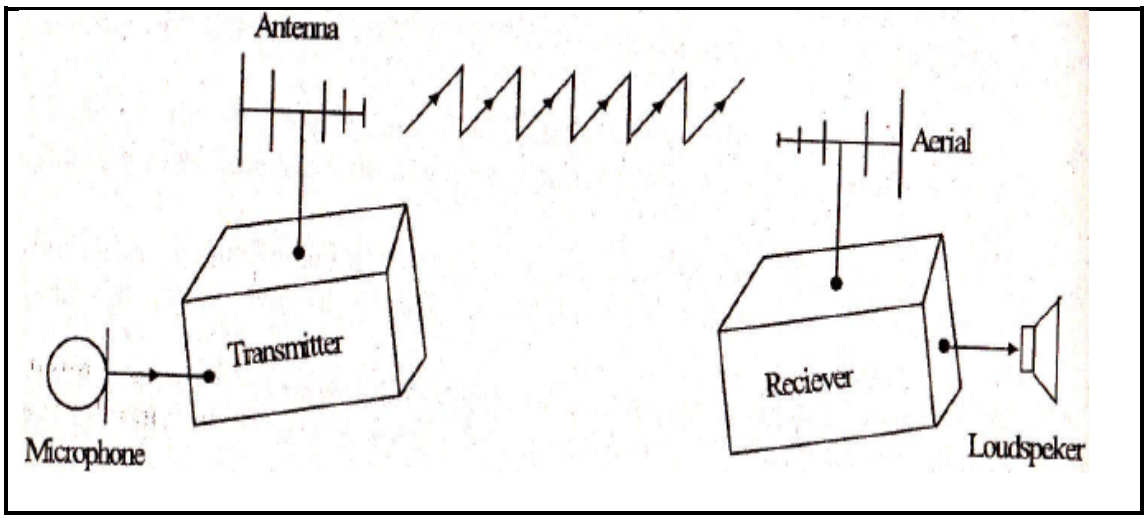


Characteristic curve of a Ge/Si diode

(One mark for each label) **[10]**

QUESTION 6

6.1



(3 × 2) (6)

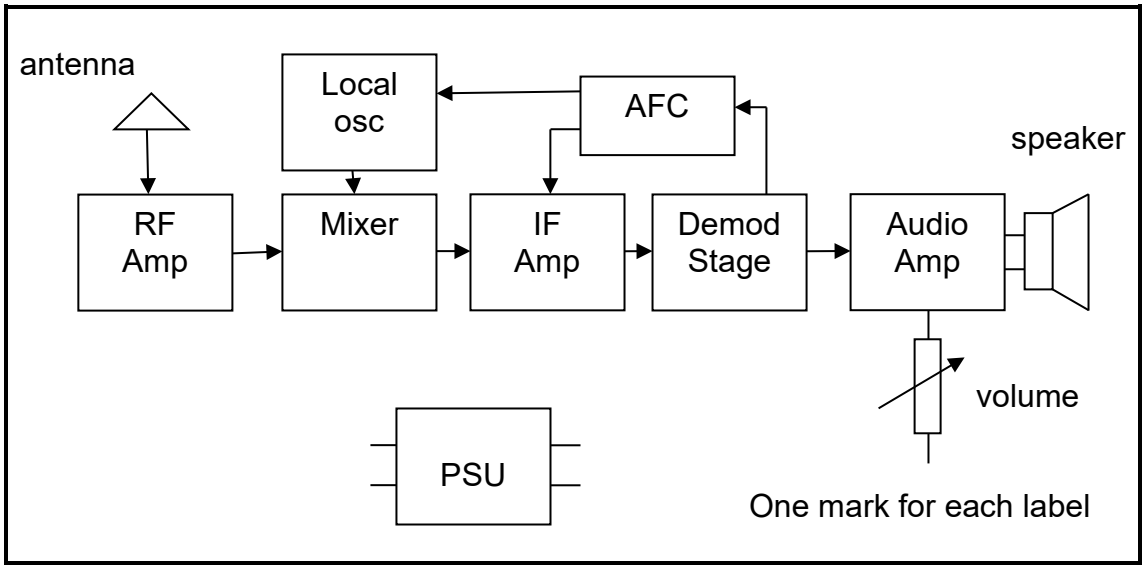
6.2

- Microphone changes sound waves to electrical waves
- Transmitter generates radio frequencies
- Transmitting aerial radiates these waves into space
- Aerial at the receiver intercepts the radiated waves
- Receiver amplifies and selects the desired frequencies and demodulates/detects the information
- Loudspeaker converts detected electrical signals into sound to reproduce the original information (12)

[18]

QUESTION 7

7.1



(10)

7.2
- It is easier to design AM apparatus
- AM is generally cheaper
- AM can be used in long distance transmission (3)

7.3
- AM is noisy transmission
- It is not good quality (2)

[15]

QUESTION 8

- Cathode ray displays picture
- Power supply feed the circuit with voltage and current
- Signal processing circuits produce video, sound and sync pulses
- Scanning circuits generate line and field waveforms
- Loudspeaker generates sound **[10]**

QUESTION 9

9.1 Contrast it is the difference between the black and white parts of the picture.

9.2 The video amplifier amplifies the video signal to drive the cathode ray tube.

9.3 Pincushion distortion means the deformation of the picture at the edges of the raster.

9.4 A shadow mask is a perforated steel plate mounted inside the tube in front of the screen.

9.5 The field oscillator generates a frequency of 50 hz for the vertical deflection. It is a synchronised oscillator.

(5 × 2) **[10]**

QUESTION 10

- Volts/division
- Time/division
- Brightness
- Focus
- Y-shift
- X-shift
- Mode
- Ac/dc/ground **[7]**

TOTAL: 100