higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

AUGUST EXAMINATION

RADIO AND TELEVISION THEORY N1

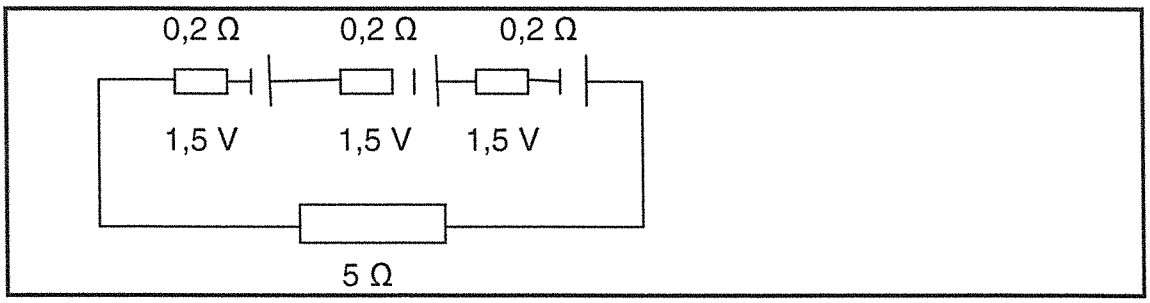
21 JULY 2014

This marking guideline consists of 6 pages.

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QUESTION 1

1.1



1.2 Emf = 1,5 v × 3√

= 4,5 V√

1.3 Rin = 0,2 Ω × 3√

= 0,6 Ω√

1.4 $It = \frac{Emf}{R + Rin}$

$= \frac{4,5}{5 + 0,6}$√

= 0,804 Ω√

1.5 Voltage drop = It × Rin

= 0,804 × 0,6√

= 0,482 V√

(5 × 2) **[10]**

QUESTION 2

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

$= \frac{20}{0,707\sqrt{}}$ 2

= 28,29 V√

2.2 RMS value = 0,707 × Vp

= 0,707 × 28,29√

= 20 V√

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2.3 $$Wavelength = \lambda = \frac{V}{F}$$
$$= \frac{3 \times 10^8}{50}$$
$$= 6 \times 10^6 \ meters$$

2.4 $$Generation\ period = \frac{1}{f}$$
$$= \frac{1}{50}$$
$$= 20 \ m/s$$

2.5 The propagation velocity per seconds

Velocity = frequency × wavelength

= 50 Hz × 6 × 10^6 √

= 3 × 10^3 m/s√

(5 × 2) **[10]**

QUESTION 3

3.1 1 µf = 1 × 10^{-6} f

3.2 1 nf = 1 × 10^{-9} f

3.3 1 pf = 1 × 10^{-12} f

3.4 1 µf = 1 000 nf

3.5 1 nf = 1 000 pf

(5 × 1) **[5]**

QUESTION 4

4.1 Automatic Gain Control√

4.2 Automatic Frequency Control√

4.3 Very High Frequency√

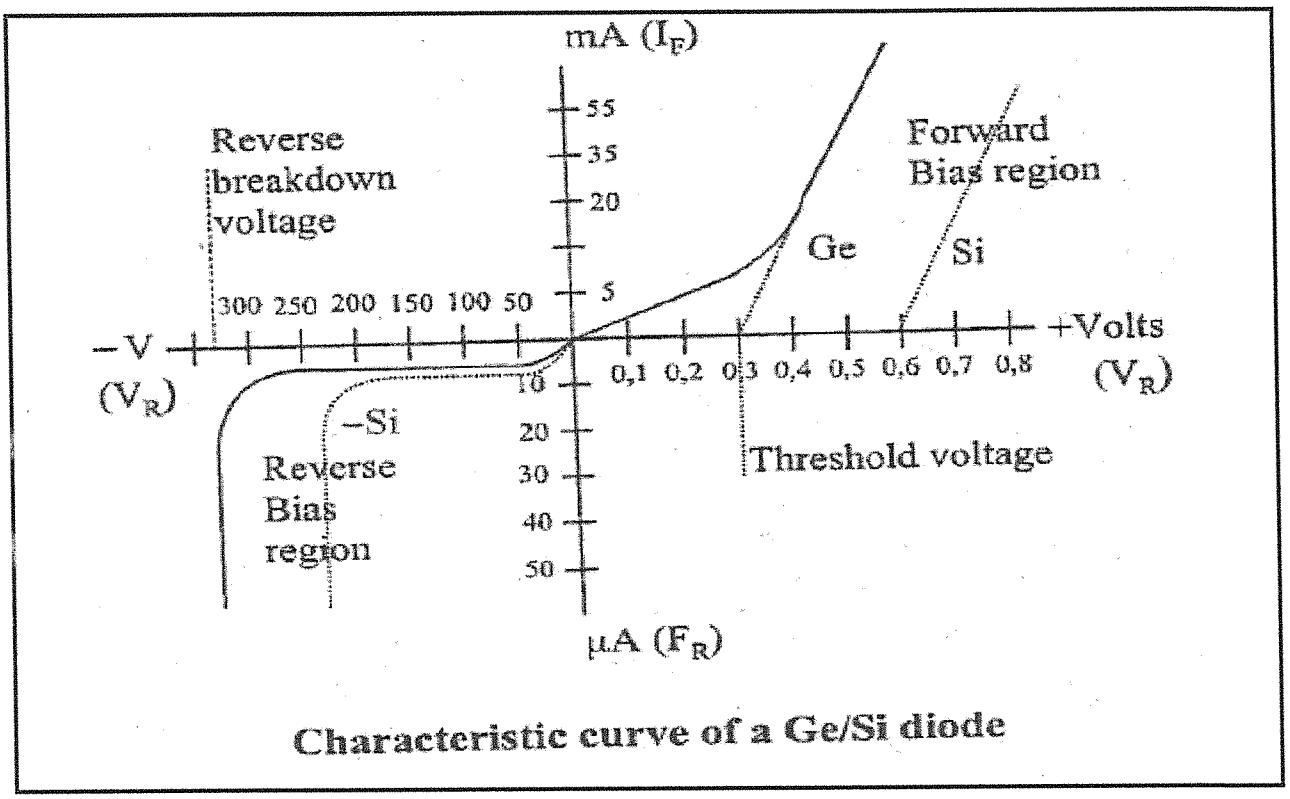
4.4 Ultra High Frequency√

4.5 Intermediate Frequency√

(5 × 1) **[5]**

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QUESTION 5

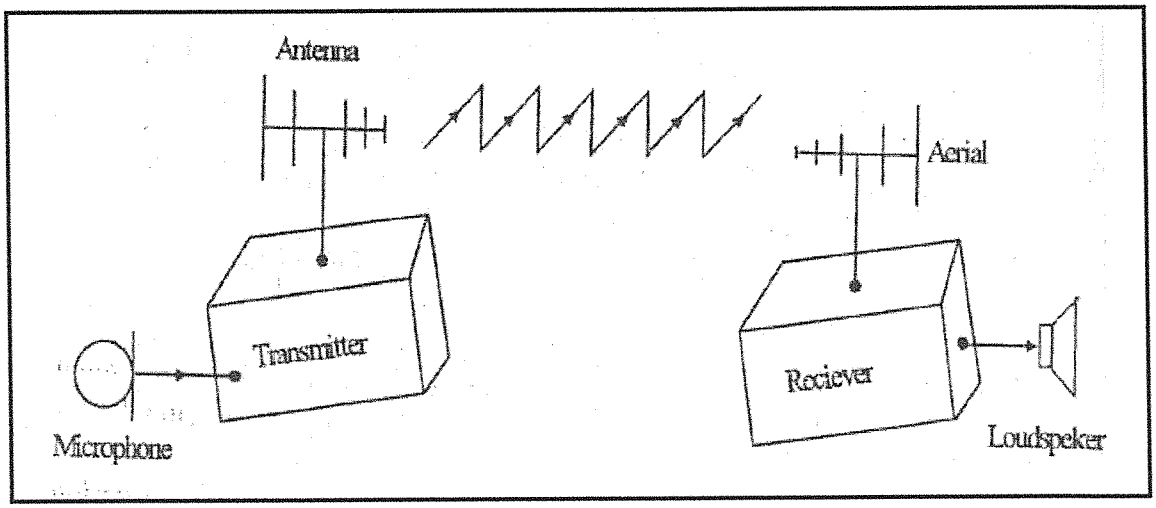


Characteristic curve of a Ge/Si diode

[10]

QUESTION 6

6.1



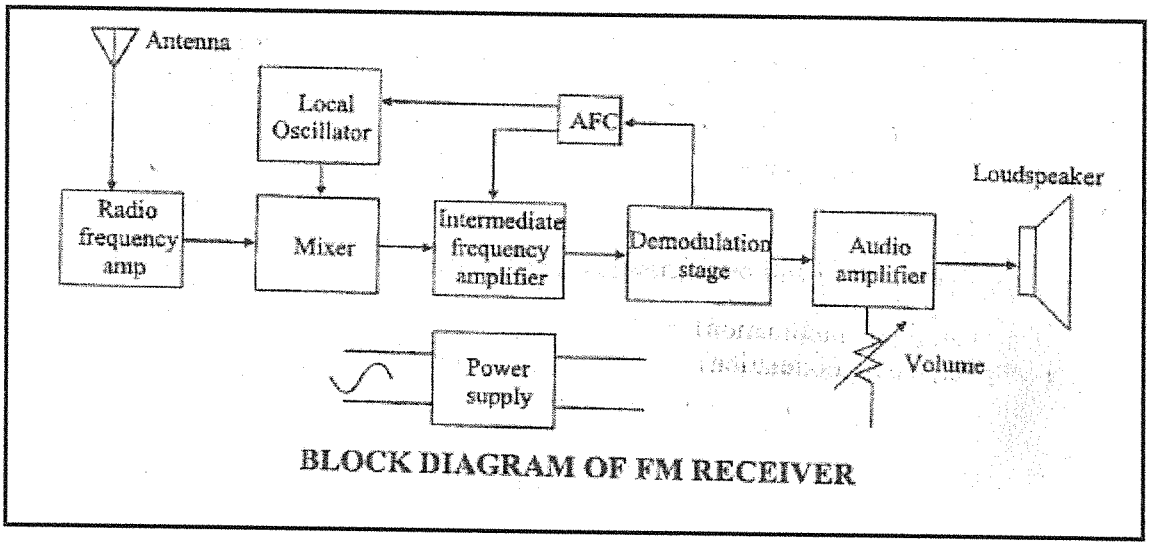
(6)

6.2
- The function of the microphone is to control the radio waves in line with the transmitted information√√
- The transmitter generates radio freguencies√√
- The transmitting aerial radiates these waves into space√√
- The aerial at the receiver intercepts the radiated waves√√
- The receiver amplifies and selects the desired frequencies and demodulates/detects the information√√
- The function of the loudspeaker is to convert the detected electrical signals into sound, to reproduce the original information √√

(12)
[18]

QUESTION 7

7.1



BLOCK DIAGRAM OF FM RECEIVER

(10)

7.2
- It is easier to design AM apparatus√
- AM is generally cheaper√
- AM can be used in log distance transmission√

(3)

7.3
- AM is noisy transmission√
- It is not good quality√

(2)
[15]

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QUESTION 8

- The cathode ray to display the picture√√
- The power supply to feed the circuit with voltage and current√√
- Signal processing circuits to produce the video , sound and sync pulses√√
- Scanning circuits to generate line and field waveforms√√
- The loudspeaker to generate sound√√ **[10]**

QUESTION 9

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

9.2 Video amp the video signal is raised from 1 volt peak to peak to ± 150 V peak to peak required to drive the cathode ray tube from black to peak white√√

9.3 Pincushion distortion the deformation of the picture at the edges of the raster√√

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

9.5 The field oscillator it provides the vertical deflection at a frequency of 50 Hz for scanning the beam. 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

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