higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

APRIL EXAMINATION

RADIO AND TELEVISION THEORY N1

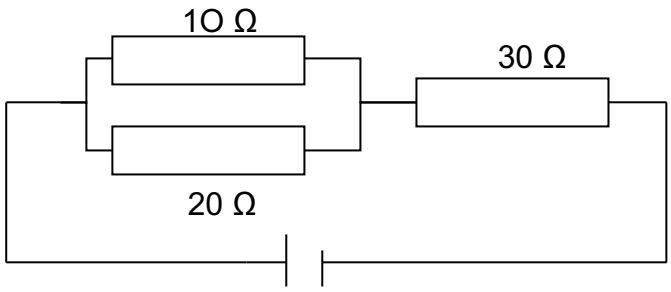
30 March 2016

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QUESTION 1

1.1



(2)

1.2 1.2.1 Total resistance.

$R_T = \frac{10 \times 20}{10+20} + 30$✓

= 36, 667 Ω✓

1.2.2 The total current of the circuit.

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

$= \frac{12}{36,667}$✓

= 0,327 A✓

1.2.3 The voltage drop across 30 ohms.

$V_r = I_T \times R$

= 0,327 × 30✓

= 9,81V✓

1.2.4 The power dissipation of the circuit.

P = $V_T \times I_T$✓

= 12 × 0,327

= 3,924 W✓ (4 × 2) (8)

[10]

QUESTION 2

2.1 The purpose of the cathode ray tube (CRT) is to display a picture.

2.2 Modulation is the process of superimposing two frequencies in a heterodyne receiver.

2.3 Demodulation is the process of recovering the audio frequency from the carrier waveform.

2.4 Intermediate frequency is produced by the mixer and the local oscillator, the frequency produced is 455 kHz for an AM receiver.

2.5 Frequency modulation (FM) is the process in which the frequency of the carrier wave is made to vary in accordance to the instantaneous value of the modulating signal.

(5 × 2) **[10]**

QUESTION 3

3.1 3.1.1 Primary cell consists of a first electrode of zinc in a liquid which acts chemically. A second electrode is used made up of carbon, copper or platinum which is also immersed in the electrolyte. The second electrode is positive with respect to the first electrode (zinc).

3.1.2 Secondary cell is one in which the electrodes and electrolyte are altered by chemical action that takes place when the cell delivers current. Secondary cell has a high discharge current, high efficiency, lower internal resistance with a high electromotive force and it can be recharged.

(2 × 5) (10)

3.2
- Expensive
- Regular maintenance is required.
- Heavy
- Short life span
- Must be kept in upright position.

(Any 4 × 1) (4)

3.3
- Cheap
- Small in size
- Disposable
- Readily available
- Various sizes available

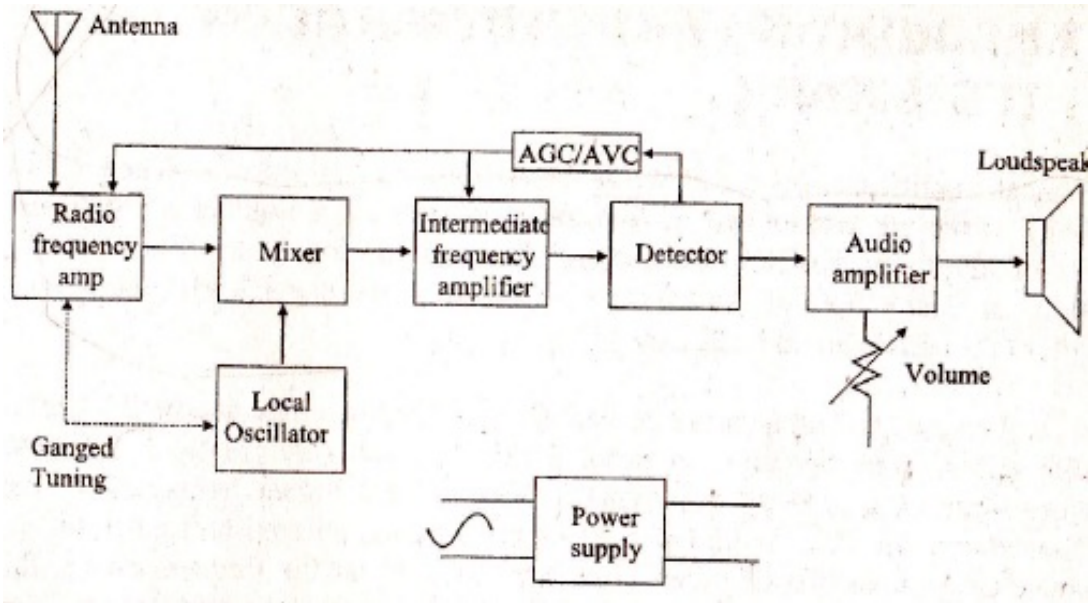
(Any 4 × 1) (4)

[18]

QUESTION 4

4.1 D
4.2 F
4.3 G
4.4 H
4.5 A
4.6 C
4.7 I
4.8 B
4.9 J
4.10 E (10 × 1) **[10]**

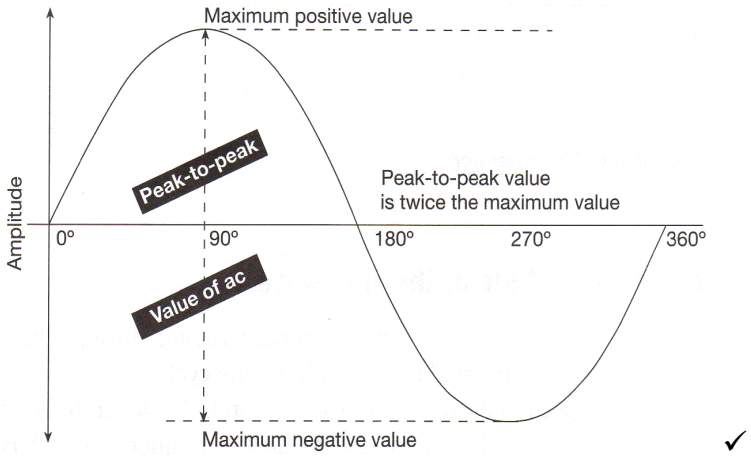
QUESTION 5



[10]

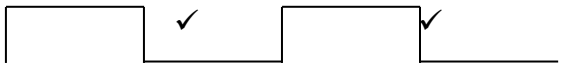
QUESTION 6

6.1 6.1.1 Sine wave✓



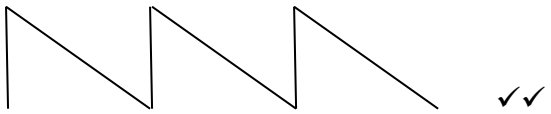
✓

6.1.2 Square wave



✓ ✓

6.1.3 Saw tooth



✓✓

(3 × 2) **[6]**

QUESTION 7

7.1
- Frequency
- DC voltage
- AC voltage
- Time period
- Phase difference (5 x 1) (5)

7.2 7.2.1 R_1/R_2 are voltage divider resistors for providing base voltage to forward biase the transistor.

7.2.2 C_b is a coupling capacitor for the input signal.

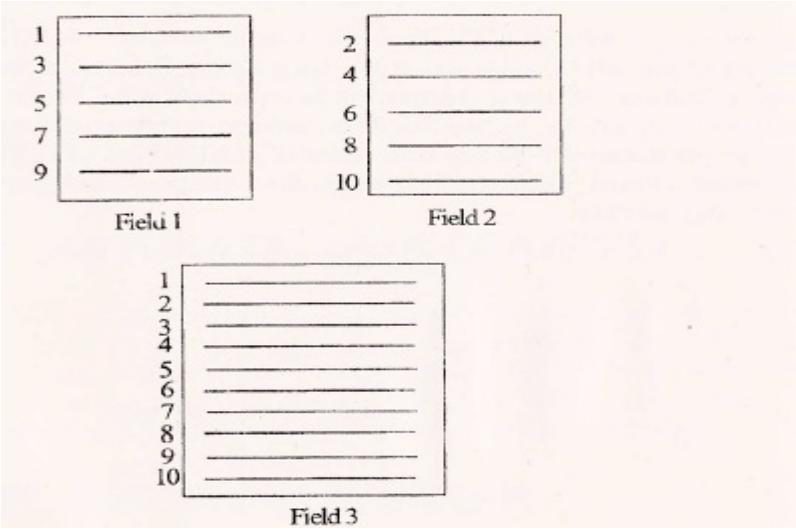
7.2.3 C_c is a decoupling capacitor for the output signal.

7.2.4 R_4 is the emitter resistor for current limiting.

7.2.5 C_e prevents negative feedback. (5 x 2) (10)
[15]

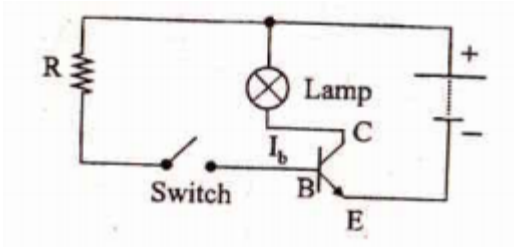
QUESTION 8

When a TV is scanned in consecutive lines, the beam is made to scan all the odd numbered lines in the order 1,3,5,7 et cetera, down to the bottom line. It then scans all the even lines 2,4,6,8 et cetera, down to the end line of the raster. From there it goes back to the beginning of line 1 and the process is repeated. ✓✓✓



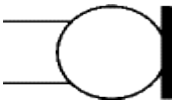
3 x 3 per field **[12]**

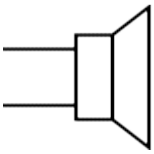
QUESTION 9

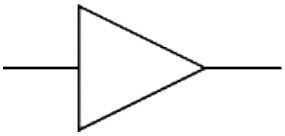


[5]

QUESTION 10

10.1 

10.2 

10.3 

10.4 

(4 × 1) **[4]**

TOTAL: 100

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