higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

RADIO THEORY N1

2 AUGUST 2019

This marking guideline consists of 6 pages.

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QUESTION 1

1.1 False
1.2 True
1.3 False
1.4 False
1.5 True
1.6 False
1.7 False
1.8 True
1.9 True
1.10 True

(10 × 1) **[10]**

QUESTION 2

2.1 $R = \frac{\rho.\ell}{A}$ ✓

$\ell = \frac{A.R}{\rho}$ ✓

$\ell = \frac{1 \times 10^{-3} \times 2}{35 \times 10^{-6}}$ ✓

= 57,143 mΩ✓ (4)

2.2
- Solid
- Plasma
- Liquid
- Gas

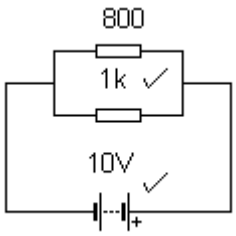
(4)

2.3 A molecule is the smallest part✓ of a compound.✓ (2)

[10]

QUESTION 3

3.1



(2)

3.2 $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{800} + \frac{1}{1000}$ ✓

= 0,00225✓

R_T = 444,444 Ω✓ (3)

3.3 $I = \frac{V}{R} = \frac{10}{444,444}$ ✓

I = 0,0225 A✓ (2)

3.4 V = 10 V (1)

3.5 $I = \frac{V}{R} = \frac{10}{1000}$ ✓

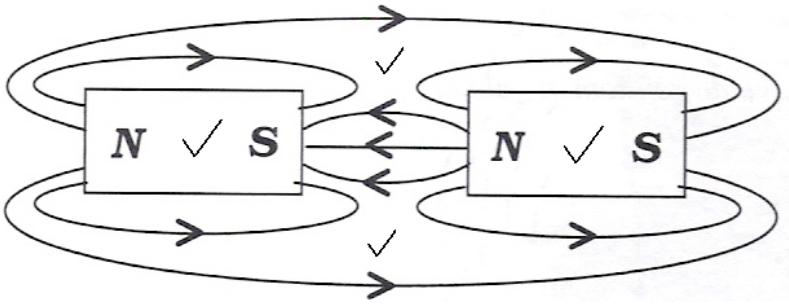
I = 0,01 Amps✓ (2)

[10]

QUESTION 4

4.1 Inductance is the ability of a conductor✓ to produce an induced voltage✓ when the current varies. ✓ (3)

4.2



(4)

4.3
- The fore finger represents the direction of the magnetic field
- The thumb represents the direction of motion of the conductor
- The center finger shows the direction of the current (3)

[10]

QUESTION 5

5.1
- The number of turns of wire
- The strength of the current flowing through the coil.
- The kind of core material.
- The ratio of coil length to its diameter (4)

52 $Rp = \frac{\text{Im}\, x\ Rm}{It - \text{Im}} = \frac{12 \times 10^{-3} \times 100}{5 - 12 \times 10^{-3}}$ ✓✓

= 0,24 Ω✓ (3)

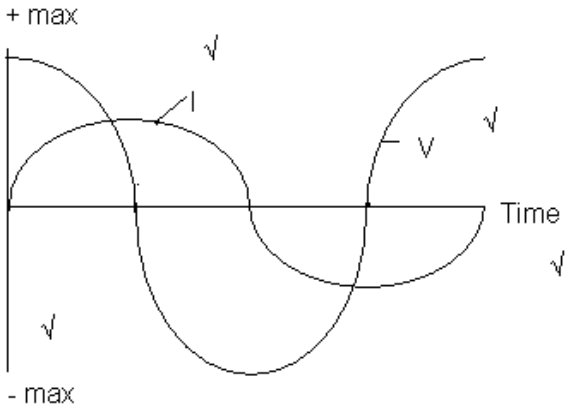
5.3
- Volts/division control
- Time/division control
- Focus control
- Intensity control
- Vertical position control
- Horizontal position control
- Trigger level control (Any 3 × 1) (3)

[10]

QUESTION 6

6.1 $F = \frac{1}{t} = \frac{1}{10^{-3}}$ ✓
= 100 Hz✓ (2)

6.1



(4)

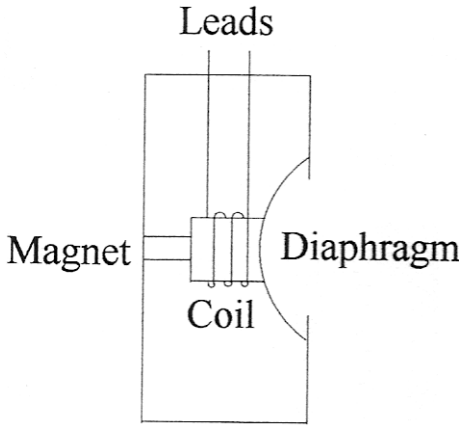
6.3
- Coil
- Magnet
- Slip rings (3)

6.4 Hertz (1)
[10]

QUESTION 7

7.1 The amplitude to the carrier changes in accordance with the modulating signal (AF signal) (2)

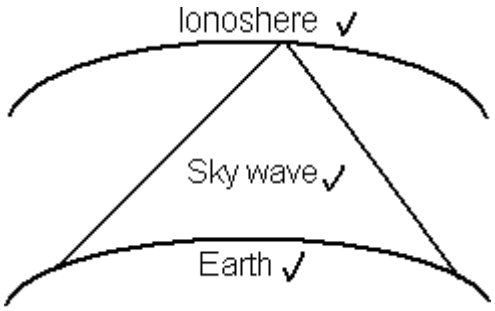
7.2



(1 mark for each label) (4)

7.3 Sound wave (1)

7.4

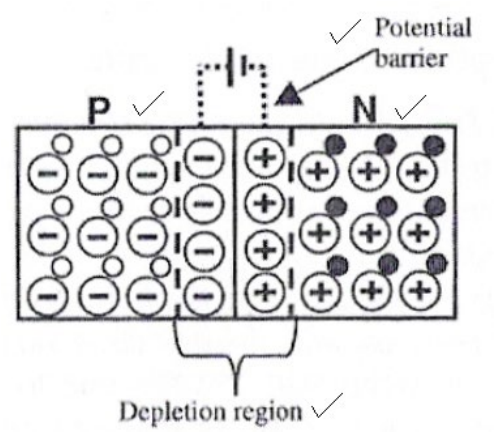


(3)
[10]

QUESTION 8

8.1 P-type semiconductor material is made by adding a trivalent atom which has three valence electrons to pure silicon or germanium which has four valence electrons.✓✓ This generates holes called acceptor doping.✓ (3)

8.2



(4)

8.3
- Base
- Collector
- Emitter

(3)
[10]

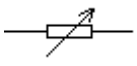
QUESTION 9

9.1 9.1.1



9.1.2

9.1.3



(3 × 1) (3)

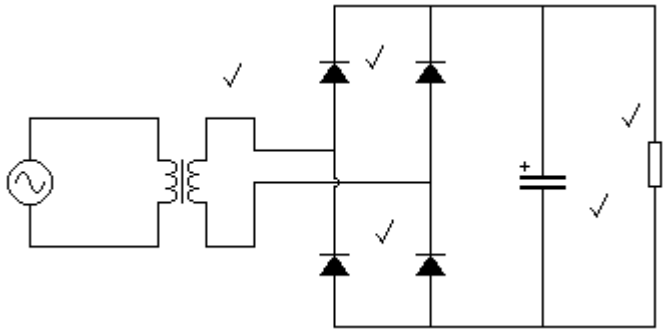
9.2
- Red
- Violet
- Yellow
- Gold (4)

9.3
- Distance between plate
- Area of plates
- Dielectric (3)

[10]

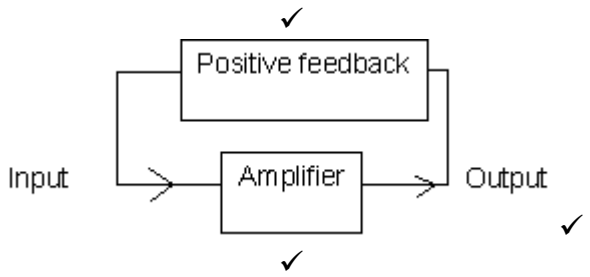
QUESTION 10

10.1



(5)

10.2



(Part of the output signal✓ is fed in phase back to the input✓) (5)

[10]

TOTAL: 100

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