



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

**NATIONAL CERTIFICATE
COMMUNICATION-ELECTRONICS N5**

28 June 2022

This marking guideline consists of 9 pages.

QUESTION 1: AC NETWORKS

- 1.1 1.1.1 The ability of a tuned circuit to discriminate against frequencies outside the resonant frequency. ✓✓
- 1.1.2 Is a measure of a component or circuit at resonance when carrying an oscillating current at a specific frequency, which is the ratio of two amounts of energy. ✓✓
- 1.1.3 Is when the capacitive reactance and inductive reactance are equal in magnitude, but cancel each other because they are 180° apart in phase and the circuit is purely resistive and the current flowing in the circuit is in phase with the supply voltage. ✓✓ (3 × 2) (6)
- 1.2 1.2.1
$$C = \frac{1}{(2\pi f)^2 L}$$

$$= \frac{1}{(2\pi \times 50)^2 \times 22,5 \times 10^{-3}}$$

$$= 450,316 \mu\text{F}$$
 ✓✓ (3)
- 1.2.2
$$V_L = I_T \times X_L \quad \text{but} \quad I_T = \frac{V_T}{R} \quad \text{and} \quad X_L = 2\pi f L$$

$$= 44 \times 7,069 \quad = \frac{220}{5} \quad = 2\pi \times 22,5 \times 10^{-3}$$

$$= 311,036 \text{ V} \quad = 44 \text{ A} \quad = 7,069 \Omega$$
 ✓✓ (4)
- 1.2.3
$$V_L = V_C \text{ (at resonance)}$$

$$V_C = 311,036 \text{ V}$$
 ✓ (1)
- 1.2.4
$$Q = \frac{1}{R} \sqrt{\frac{L}{C}}$$

$$= \frac{1}{5} \sqrt{\frac{22,5 \times 10^{-3}}{450,316 \times 10^{-6}}}$$

$$= 1,414$$
 ✓ (2)

1.3 $V_L = Q \cdot V_s$

But

$$Q = \frac{X_L}{R} \checkmark \text{ for RL resonance circuit}$$

and

$$X_L = \frac{V_L}{I_T} \checkmark \text{ and } R = \frac{V_S}{I_T} \checkmark \text{ at series resonance circuit } V_S = V_R \checkmark$$

Substitute X_L and R respectively

$$= \frac{V_L}{I_T} \times \frac{I_T}{V_S} \checkmark$$

$$Q = \frac{V_L}{V_S}$$

$$V_L = Q \cdot V_S \checkmark$$

(6)
[22]

QUESTION 2: GENERAL

- 2.1 G
- 2.2 H
- 2.3 L
- 2.4 J
- 2.5 I
- 2.6 C
- 2.7 E
- 2.8 K
- 2.9 B
- 2.10 F

(10 × 1) [10]