



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE COMMUNICATION-ELECTRONICS N5

(8080235)

**15 November 2022 (X-paper)
09:00–12:00**

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 5 pages and a formula sheet of 5 pages.

020Q1E2215

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA
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COMMUNICATION-ELECTRONICS N5
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
 2. Read all the questions carefully.
 3. Number the answers according to the numbering system used in this question paper.
 4. Start each section on a new page.
 5. Use only a blue or black pen.
 6. Write neatly and legibly.
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QUESTION 1: AC NETWORKS

- 1.1 A parallel LC-circuit consists of a variable capacitor in parallel with a $100 \mu\text{H}$ inductor. The inductor has an internal resistance of 12Ω .

Calculate the following:

- 1.1.1 The capacitor value at resonance of 45 MHz (3)
- 1.1.2 The dynamic impedance (2)
- 1.1.3 How much capacitance must be added/subtracted to obtain resonance at 48 MHz (4)
- 1.1.4 The Q-factor of the circuit at both resonating frequencies (4)
- 1.2 Derive the equation for the Q-factor for the capacitor from first principles. (10)

[23]**QUESTION 2: GENERAL**

Choose the correct word or words from those given in brackets. Write only the answer next to the question number (2.1–2.8) in the ANSWER BOOK.

- 2.1 At parallel resonance circuit, the current is (maximum/minimum). (1)
- 2.2 The decibel is fundamentally a (a) (current/power) ratio that can be expressed in terms of (b) (voltage/current) ratio when the resistances are equal. (2)
- 2.3 An asymmetrical network is correctly terminated when it is terminated by its (image/iterative) impedances. (1)
- 2.4 The primary function of the RF amplifier is to provide (demodulation/selectivity). (1)
- 2.5 Carrier waves are used in (a) (telecommunications/modulation) to convey (b) (voltage/audio) signals. (2)
- 2.6 Demodulation is the act of returning (modulated/unmodulated) data signals to their original form. (1)
- 2.7 AGC is of most importance in (AM/PM) receivers. (1)
- 2.8 One dB is the equivalent of (0,115/8,686) neper. (1)

[10]