



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE COMMUNICATION-ELECTRONICS N5

(8080235)

**17 November 2020 (X-paper)
09:00–12:00**

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


113Q1E2017

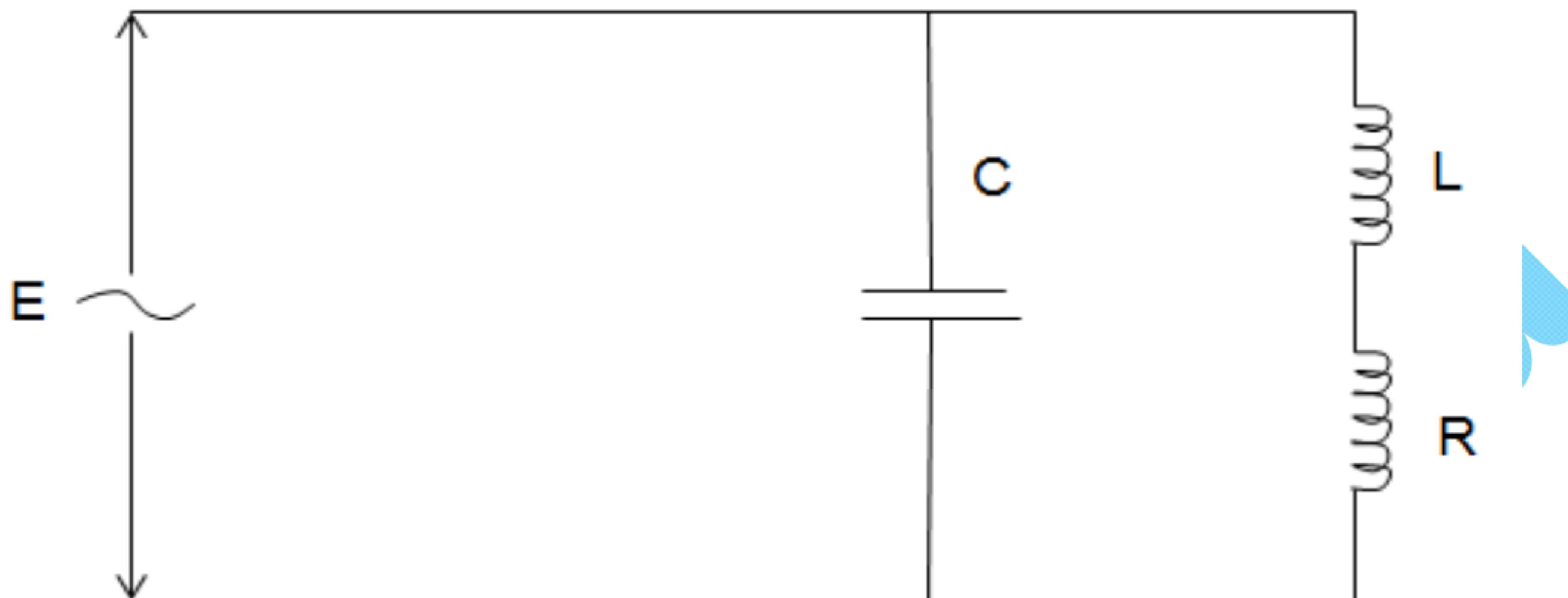
DEPARTMENT OF HIGHER EDUCATION AND TRAINING
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NATIONAL CERTIFICATE
COMMUNICATION-ELECTRONICS N5
TIME: 3 HOURS
MARKS: 100

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 question on a new page.
 5. Use only a blue or black ink.
 6. Write neatly and legibly.
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QUESTION 1

- 1.1 Use any method to derive the equation for the resonance frequency of a parallel resonant circuit. (10)
- 1.2 Study FIGURE 1 below and answer the questions. 


**FIGURE 1**

$$R = 20 \, \Omega$$

$$C = 22 \, \mu\text{F}$$

$$L = 50 \, \mu\text{H}$$

Calculate the following:

- 1.2.1 The resonant frequency  (8)
- 1.2.2 The inductive resistance at resonance (4 × 2) (8)
- 1.2.3 The capacitive reactance at resonance (3)
- 1.2.4 The Q-factor of the circuit (3)
- 1.3 What is understood by the term *selectivity* as applied to electronic circuits? [21]

QUESTION 2

- 2.1 Define *insertion loss* of a four-terminal network. (2)
- 2.2 Derive the expression for the series impedance Z_1 of a symmetrical T-type network. (12)
- 2.3 An attenuator pad receives a signal of 10 m Watt and delivers an attenuated version of 5 m Watt.

Determine the following:

- 2.3.1 The dB rating of the pad  (2)
- 2.3.2 The Z_1 and Z_2 values for π network if $Z_{OC} = 222,2 \, \Omega$ and $Z_{SC} = 80 \, \Omega$ (6)

[22]