



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

DEPARTMENT OF NATURAL AND APPLIED SCIENCES

QUALIFICATION: BACHELOR OF SCIENCE (MAJOR AND MINOR)	
QUALIFICATION CODE: 07BOSC	LEVEL: 6
COURSE NAME: ELECTRICAL CIRCUIT AND ELECTRONICS	COURSE CODE: ECE602S
SESSION: NOVEMBER 2022	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS
<ol style="list-style-type: none">1. Write all your answers in the answer booklet provided.2. Read the whole question before answering.3. Begin each question on a new page.

PERMISSIBLE MATERIALS

Scientific Calculator

THIS QUESTIONS PAPER CONSISTS OF 9 PAGES (Including this front page)

1.7 Which one of the following rectifiers was made with only one diode? (2)

- a. Full wave
- b. Half wave
- c. Both a and b
- d. None of the above

1.8 Which one of the following has two or more junction devices? (2)

- a. Thyristor
- b. Transistor
- c. Diodes
- d. None of these

1.9 A transistor is said to be in quiescent state when (2)

- a. It is unbiased
- b. No Current flows through it
- c. Emitter junction is just biased equal to collector junction.
- d. No signal is applied to the input

1.10 In a pnp transistor, the current carriers are (2)

- a. Acceptor ions
- b. Donor ions
- c. Free electrons
- d. Holes

1.11 Most of the majority carriers from the emitter (2)

- a. Recombine in the base
- b. Recombine in the emitter
- c. Pass through the base region to the collector
- d. None of these.

SECTION B

QUESTION 2

[15]

2.1 State Kirchhoff's Current Law.

(2)

2.2 A bridge circuit is shown in **Figure 2.1**. With the currents as marked, write

(5)

(a) Kirchhoff's current law at the four nodes and

(b) Kirchhoff's voltage law around the loops $abda$, $bcdb$, and $adca$.

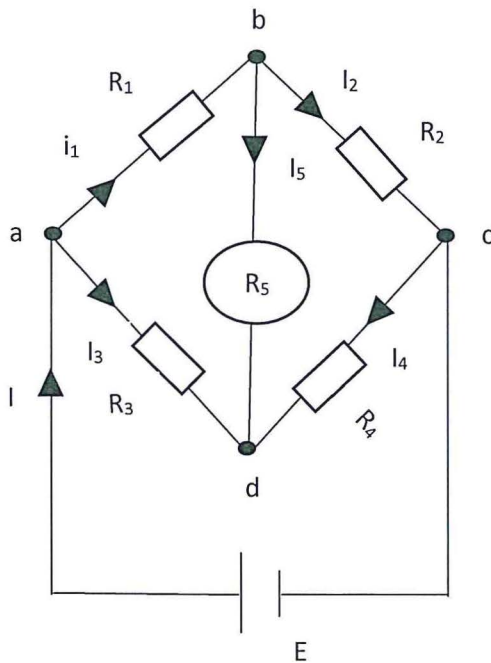


Figure 2.1.

2.3 For the bridge network shown in **Figure 2.2**, find the current in the 5Ω resistor, and its

direction, by using Thevenin's theorem.

(8)

QUESTION 4

[15]

4.1 What do you understand by the term reverse biased in semiconductor. (2)

4.2 Sketch the reverse characteristics of a germanium and silicon p-n junction diode and describe the shapes of the characteristics drawn. (4)

4.3 Briefly explain half-wave rectifier diode. (4)

4.4 A $1\text{ k}\Omega$ load resistor is connected to a half-wave rectifier circuit, shown in **Figure 4.2**. (5)

Calculate:

- The dc voltage V_{DC} and current I_{DC} ,
- The root-mean square current I_{rms}

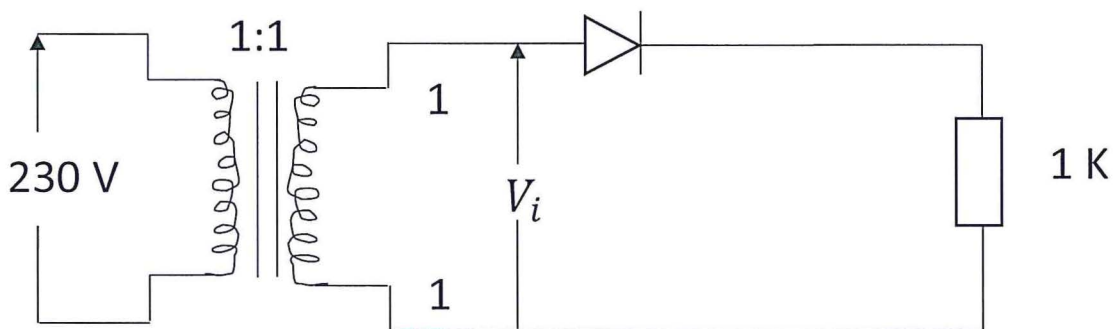


Figure 4.2.

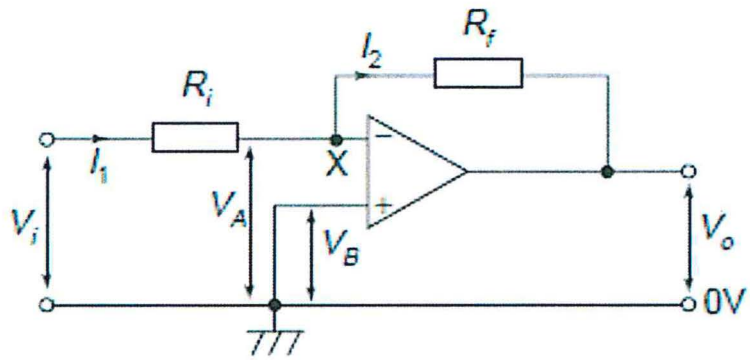


Figure 6.1.