



# NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION

DEPARTMENT OF TECHNICAL AND ENGINEERING EDUCATION AND TRAINING

**ANALOGUE ELECTRONICS PTE 2150**

First Semester Examination

NOVEMBER 2024

This examination paper consists of 3 pages

Time allowed: 3 hours

Total Marks: 100

Special requirements: NONE

Examiner's name: Mrs D. Chasokela

## INSTRUCTIONS

1. The paper consists of 3 printed pages with 6 questions.
2. Each question carries 20 marks.
3. Answer any 5 questions.

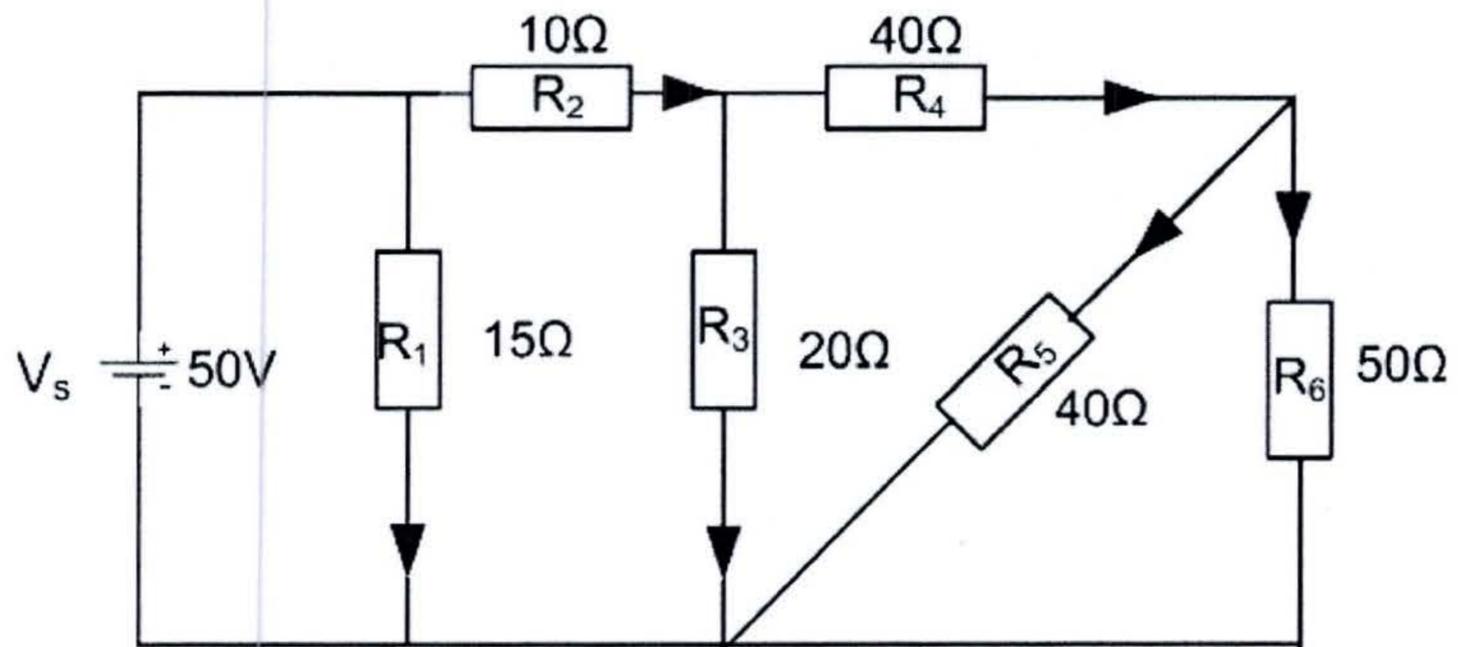
## MARK ALLOCATION

QUESTION	MARKS
1.	20
2.	20
3.	20
4.	20
5.	20
6.	20
<b>TOTAL</b>	<b>100</b>

### Question 1

- a) Construct the Diode characteristics graph and explain its operation. [10 marks]  
b) Show the half-wave rectifier and full wave rectifier input and output wave forms. [10 marks]

### Question 2



- (a) Total Resistance  
(b) Total Current  
(c) Current through each resistor  
(d) Voltage through each resistor

[20 marks]

### Question 3

Three resistors  $R_1 = 900\Omega$ ,  $R_2 = 5K\Omega$ ,  $R_3 = 7M\Omega$  are connected in series across voltage supply of 200V

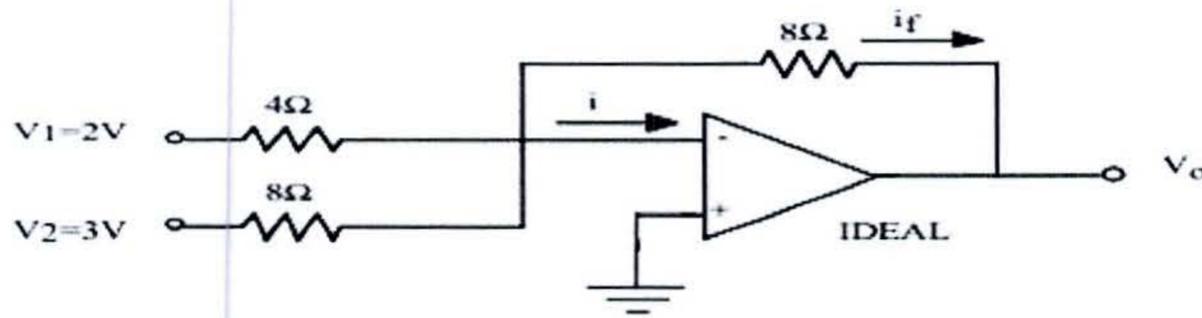
- (a) Calculate the total resistance (b) calculate the total current (c) Determine the current passing through each of the resistors (e) Voltage across each resistor

[20 marks]

#### Question 4

Find current  $I$  and output voltage  $V_o$  in Fig 4

[20 marks]



#### Question 5

a) Convert the colour codes for the following resistors

[10 marks]

- i) Grey, Red, Gold, Gold ii) Grey, Red, Green, No colour iii) Yellow, Violet, Black, Gold  
iv) Grey, black, orange, brown v) Brown, green, red, No colour, Gold

b) Generate the colour codes for the following resistors

[10 marks]

- i)  $4.7M\Omega$ , 10% ii)  $3k\Omega$ , 10% iii)  $8.2M\Omega$ , 20% iv)  $47\Omega$ , 5%  
v)  $27000\Omega$ , 10%

#### Question 6

a) State five requirements for receiving and demodulation for both AM and FM receivers.

[5 marks]

b) Appreciate and briefly explain the detectors, oscillators, mixers and amplifiers.

[15 marks]