



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION

ELECTRONIC, POWER SOURCES AND CIRCUITS

PDT6229

MAIN Second Semester Examination Paper

May 2019

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 has 3 printed pages.
2. Each question carries 20 marks.
3. Answer question 1 and any other 4.
4. Start your answer for each question on a fresh page.

MARK ALLOCATION

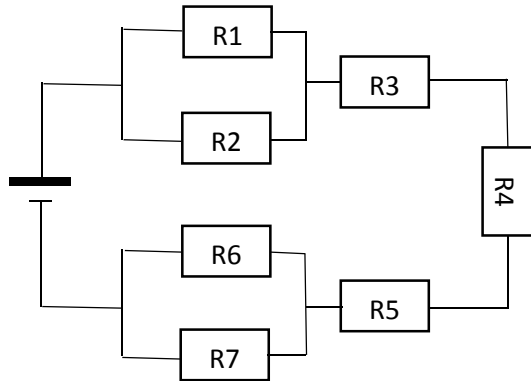
QUESTION	MARKS
1.	20
2.	20
3	20
4.	20
5.	20
6.	20
TOTAL	100

QUESTION 1

Design a system that switches on the outside light when an object moves closer to the main door at night. Be creative and make use of electronic devices effectively. Give a brief operation of the designed system. **[20 marks]**

QUESTION 2

Fig 1 shown below indicates $R_1=20\Omega$; $R_2=20\Omega$; $R_3=5\Omega$; $R_4=10\Omega$; $R_5=15\Omega$; $R_6=25\Omega$; $R_7=100\Omega$ and $V_{bat}=120V$.



Calculate (a) Current leaving the battery

[6 marks]

(b) Power supplied by the battery

[7 marks]

(c) Voltage across R_5

[7 marks]

QUESTION 3

Draw symbols and explain operations and applications for the following electronic devices used in electronic circuit laboratory: diode, zener diode, light emitting diode and photo diode. **[20 marks]**

QUESTION 4

Differentiate a series circuit from a parallel circuit in terms of I , R , V and ohm's law. Illustrate the circuits using both resistors and lamps in separate circuits.

[20 marks]

QUESTION 5

- (a) Illustrate a series, parallel and series-parallel circuits using lamp connection. **[10 marks]**
- (b) Differentiate AC and DC by sketches. **[10 marks]**

QUESTION 6

- (a) Which are the 2 equations that can be used to solve resistors connected in parallel and when they are applied? **[4 marks]**
- (b) In a lighting system the 2 bulbs in parallel have $R_1=5$ and $R_2=10$. Calculate the total resistance in the circuit. **[4 marks]**
- (c) A designer decides to have 5 bulbs connected in parallel with resistances R_1 to R_5 where $R_1=1 \Omega$; $R_2=5 \Omega$; $R_3=10 \Omega$; $R_4=15 \Omega$ and $R_5=20\Omega$. Calculate the total resistance. **[4 marks]**
- (d) Calculate power dissipated in a circuit when $V=200\text{Volts}$ and $R=20 \Omega$ **[4 marks]**
- (e) Show the symbols of direct I, AC, transistor and a fuse. **[4 marks]**

END OF EXAMINATION