

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATION

RESIT/SPECIAL EXAMINATION

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE
IN NATURAL RESOURCES MANAGEMENT AND WILDLIFE ENTREPRISE AND
MANAGEMENT**

PHYS 111/103: GENERAL PHYSICS

STREAMS: BSC NARE/WIEM

TIME: 2 HOURS

DAY/DATE: FRIDAY 05/11/2021

2.30 P.M – 4.30 P.M

INSTRUCTIONS

Answer question one and any other two questions

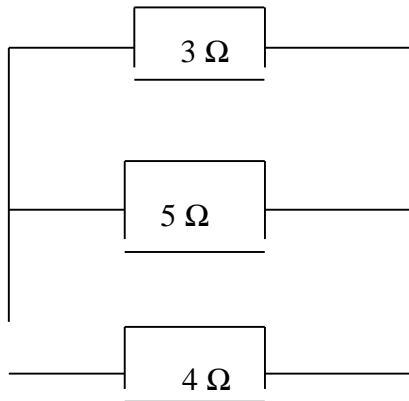
Do not write anything on the question paper

QUESTION ONE (30 MARKS)

- 1 a) i) State the two types of errors [2marks]
ii) Explain how to minimise the errors above [2marks]
- b) i) Define refraction of light [2marks]
ii) A ray of light travelling through a liquid of absolute refractive index 1.4 is incident on the plane surface of a Perspex block at an angle of 55° . Calculate the angle of refraction in the Perspex if it has an absolute refractive index 1.5 [4marks]
- c) i) Define the following
Displacement
Velocity
Acceleration [3marks]
ii) A body of mass 50 kg initially moving at 20 m/s accelerates to a velocity of 30 m/s in 5 seconds. Calculate the force acting on the body. [3marks]
- d) A charge of quantity $9 \times 10^{-6} \text{C}$ flows through a conductor in 20 seconds, calculate the amount of current in the conductor [3marks]

e) State Newton's laws of motion [3marks]

f) i) Obtain the effective resistance in the figure below



[3marks]

ii) If a voltage of 12 V is applied across the arrangement, calculate the total current the circuit

[3marks]

g) Differentiate between heat capacity and specific heat capacity [2marks]

QUESTION TWO (20 MARKS)

2 a) i) Define the following terms

Principle focus

Focal length

[2marks]

ii) Show that image formed by a plane mirror is as far behind the mirror as the object is in front

[6marks]

b) An object is placed 20 cm from a concave mirror of focal length 15 cm, show using ray construction the location of the image, describe the characteristics of the image [6marks]

c) By applying mirror formula, find the position of an object that gives an image located 15 cm in front of a concave mirror of focal length 10 cm. [6marks]

QUESTION THREE (20 MARKS)

3 a) Define specific latent heat of fusion [2marks]

b) 5 kg of ice at a temperature of -4°C is converted to water at a temperature of 75°C . Calculate the quantity of heat used. (Take specific heat capacity of ice 2100 J/kg/k , specific latent heat of fusion of ice $1.7 \times 10^5\text{ J/Kg}$, specific heat capacity of water 4200 J/kg/k)

[7marks]

- c i) Explain why heat transfer is faster in metal conductors than in non metals [2marks]
- ii) Explain the three modes of heat transfer [6marks]
- d) Differentiate between evaporation and boiling [3marks]

QUESTION FOUR (20 MARKS)

5 a) Starting from Newton’s second law of motion show that

$F=ma$ [3marks]

b) Define the following

Electric potential

Electric current [2marks]

c) State Kirchhoff’s law [2marks]

d) With the aid of a diagram, describe the use of diodes in full wave rectification [5marks]

e) Calculate the current through each resistor in the circuit diagram below [8marks]

