



**UNIVERSITY OF SWAZILAND
SUPPLEMENTARY EXAMINATION PAPER**

**PROGRAMME: DIPLOMA IN AGRICULTURE 1
DIPLOMA IN AGRICULTURAL EDUCATION 1
DIPLOMA IN HOME ECONOMICS 1
DIPLOMA IN HOME ECON. EDUCATION 1
REMEDIAL YEAR IN AGRICULTURE
REMEDIAL YEAR IN AGRIC. EDUCATION
REMEDIAL YEAR IN HOME ECONOMICS
REMEDIAL YEAR IN HOME ECON. EDU.**

COURSE CODE: LUM 100

TITLE OF PAPER: PHYSICS

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO
OTHER QUESTIONS.**

SECTION I
COMPULSORY

QUESTION 1

- a) A farmer's animals left home and moved 3 km at 30° N of E and then 4 km southeast. Determine the distance and the direction the farmer must set off from the homestead to the animals.

[10 Marks]

- b) Write the three fundamental equations of linear motion.

[6 Marks]

- c) Distinguish between fundamental and derived quantities.

[4 Marks]

- d) Define and estimate the value of one atmospheric pressure

[5 Marks].

- e) State Archimedes principle and give one application of the principle in every day life.

[5 Marks].

- f) A converging lens has a focal length of 20cm and an object is placed 30cm from it. Calculate the image position and its magnification.

[10 Marks].

SECTION II

ANSWER ANY TWO QUESTIONS FROM THIS SECTION

QUESTION 2

a) Define the following:

- i) Specific heat capacity,
- ii) Specific latent heat of fusion, and
- iii) Boyle's law of gases.

[9 Marks]

b) A 1.5 kg block of heated steel at 120°C is dropped into 500 g of water at 20°C . If the specific heat capacity of steel is $200 \text{ J/kg}^{\circ}\text{C}$, calculate the final temperature of water and steel. (Specific heat capacity of water $4200 \text{ J/kg}^{\circ}\text{C}$).

[13 Marks]

c) A gas in a cylinder has a pressure of 280 kPa at 7°C . Find the new pressure if the temperature rises to 87°C .

[8 Marks]

QUESTION 3

a) State the laws of reflection

[5 Marks]

b) Sketch the following mirrors;

(i) Plane

[2.Marks]

(ii) Concave

[2.Marks]

(iii) Convex

[2.Marks]

c) What are step-down and step-up transformers?

[4.Marks]

d) The P.D across a resistance of 20 Ohms is 5V. Calculate the current flowing. If the current is increased to 0.5A, what is the new P.D across the resistor?

[15 Marks].

QUESTION 4.

a) The frequency obtained from a plucked string is 400 Hz when the tension is 2 N. Calculate

- (i) the frequency when the tension is increased to 8 N
- (ii) the tension needed to produce a note of frequency 600 Hz.

[20 Marks]

b) A rectangular box rests on a flat horizontal surface and has a weight of 100 N. Calculate the pressure on the surface if the base of the box has an area of 2 m^2

[10 Marks]