



UNIVERSITY OF SWAZILAND
SUPPLEMENTARY EXAMINATION PAPER

PROGRAMMES: ALL YEAR 1 PROGRAMMES

COURSE CODE: ABE 101

TITLE OF PAPER: PHYSICS

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER QUESTIONS ONE AND ANY TWO OTHER QUESTIONS.

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PHYSICS
SUPPLEMENTARY EXAMINATION

Question 1: Compulsory

- (a) Explain the characteristics of resistance and how it differs between a series and parallel circuit connections. [10 marks]
- (b) Show that the image of an object is as far behind as it is in front of a plane mirror. [10 marks]
- (c) Define the following terms; *STEP-DOWN* and *STEP-UP* Transformers and where each is used in practice. [10 marks]
- (d) Define the following terms and give their dimensions;
- (i) Speed [2.5 marks]
 - (ii) Power [2.5 marks]
 - (iii) Electric Charge [2.5 marks]
 - (iv) Work [2.5 marks]

Question 2

A ball with a mass of 50 kg is raised to a height of 60 m and then allowed to fall back on its own. Assume $g = 10 \text{ w / kg}$.

- (a) Calculate its potential and kinetic energy. [20 marks]
- (b) What can you conclude from the results above with special reference the law of energy conservation. [10 marks]

Question 3

- (a) What is the importance of studying optics in agriculture? Give four reasons. [10 marks]
- (b) Sketch the following mirrors. [10 marks]
- (i) Plane
 - (ii) Concave
 - (iii) Convex

(c) (i) Define Ohm's Law. [5 marks]

(ii) And give its expression in relation to resistance, voltage and current. [5 marks]

Question 4

(a) Why is there no sound in space?

(i) because there is no air.

(ii) because there is no gravity.

(iii) because there is no light.

(iv) because there is no magnetic field. [5 marks]

(b) The earth connection fitted in an electric appliance protects,

(i) the heating element of the appliance.

(ii) the person using the appliance.

(iii) the cable connecting the appliance.

(iv) the fuse in the circuit. [5 marks]

(c) Two cars travel the following routes;

Cars A travels from Siteki to Lavumisa (which is South of Siteki) and then from Lavumisa to Mbabane (North of Lavumisa) covering 540 km in 3 hours. Car B travels from Hlatikulu to Maloma (east of Hlatikulu) then from Maloma to Manzini (North of Maloma) covering a distance of 350 km in 2.5 hours. Calculate their;

(i) Speeds [7.5 marks]

(ii) Velocities [7.5 marks]

(d) What is a transformer? [5 marks]