

**KCSE ONLINE REVISION**  
**TERM II**  
**MID TERM EXAM**  
**PHYSICS**  
**FORM 3**

NAME .....ADM NO.....CLASS.....

1. (a) State two differences between the images formed by a pinhole camera and a plane mirror. (2mks)

(b) An object of mass 120g half immersed in water displaced a volume of  $20\text{cm}^3$ . Calculate the density of the object. (2mks)

(c) Why is it colder or clear sky than a cloudy sky at night? (1mk)

(d) A vibrator produces 48 ripples per 6 seconds across a water tank. The ripples are 4cm apart. Calculate the velocity of the ripples. (3mks)

(e) The figure below shows two identical springs arranged in parallel. Determine the total extension produced by the arrangement, given that a single spring extends by 2cm when supporting 40N weight. (2mks)

2. (a) A body is moving with uniform acceleration. Its velocity after 5 second is 26m/s and after 9 seconds IT IS 42M/S. Calculate

i. Acceleration of the body. (2mks)

ii. Its initial velocity (2mks)

iii. Displacement covered during this period (1mk)

(b) A steel ball is released into a liquid of high viscosity. The ball accelerates for 0.2sec and then acquires terminal velocity after 1.0sec.

i. Draw the steel ball indicating forces acting on the steel ball. (1 ½ mks)

ii. Define the term terminal velocity. (2mks)

iii. Sketch the graph showing the velocity against time of the steel ball during this period. (1 ½ mks)

(c) (i) The figure below shows a semi circular block with a ray of light travelling from a dense medium to a less dense medium. Calculate the refractive index of the block.

(3mks)

(ii) State two advantages of using an optic fibre in communication compared to ordinary copper cable. (2mks)

3. (a) A bullet of mass 20g is fired at 400m/s to a concrete wall. Calculate the heat energy transferred to the wall (assumption all energy of the bullet is converted to heat energy) (3mks)

(b) A force of 20N is used to stretch a spring through 5cm. Find the elastic potential energy stored in the spring. (3mks)

(c) A pulley system having  $VR=4$  is used to raise a load of  $80N$  through a height of  $0.6m$  at constant speed using an effort of  $20N$  in a time of  $15$  seconds.

(i) Draw the diagram showing the pulley system. (2mks)

(ii) Calculate the MA of the pulley system. (2mks)

(iii) Find the efficiency (2mks)

(iv) Calculate the power developed by the effort. (2mks)

(d) An inclined plane is used to raise 500N of load

(i) Calculate the VR of the inclined plane. (2mks)

(ii) If an effort of 300N is applied. Find the efficiency of the inclined plane. (3mks)

(e) A simple pendulum oscillates between point A and C as shown

(i) State the form of energy at

A-

B -

(ii) Find the speed of the bob when passing point B. (3mks)

(f) Why is it easier to use a screw driven with a wider handle than a thinner one. (1mk)

4. (a) A student was provided with the following connecting wires dry cell variable resistor, switch ammeter voltmeter. She was required to measure voltage across the cell for various values of current drawn from it.

(i) Draw possible current diagram for this experiment. (2mks)

(ii) Briefly state how the results were obtained. (2mks)

(b) A material of resistance  $0.5\Omega$  has a cross sectional area of  $2.0 \times 10^{-6} \text{ m}^2$  and resistivity of  $4.9 \times 10^{-7} \Omega\text{m}$ . Find the length of the material. (3mks)

(c) Study the circuit below and use it to answer the questions below.

(i) Determine the effective resistance of the circuit. (2mks)



(ii) Find the ammeter reading. (2mks)

(iii) Find the Pd between XY (2mks)

(d) In an experiment to determine the emf and internal resistance the following circuit was used.

It was noted that when S is open the voltmeter reads 1.5V and when S is closed the reading is 1.3V and the ammeter reads 0.2A.

(i) What is the emf of the cell? (2mks)

(ii) Determine the lost volts. (2mks)

(iii) Find the value of R (2mks)

(iv) Find the internal resistance of the cell. (2mks)

(e) Study the circuit diagram below and answer the question that follow

Find:

(i) The effective resistance  
(2mks)

(ii) The ammeter reading (2mks)

(iii) Current through the  $4\Omega$  resistance

(2mks)

A set up below was used to determine resistor R.

Given that the balance point is 40cm from end A. find the resistance R.(3mks)

