

BUDAKA PROGRESSIVE HIGH SCHOOL

END OF TERM II EXAMS 2019

S.3 Physics Paper 2

Time: 2 hours 15 minutes

Instructions

❖ Attempt any **FIVE** questions from this paper.

❖ Assume where necessary;

Acceleration due to gravity, $g = 10\text{ms}^{-2}$

Density of water $= 1000\text{kgm}^{-3}$

1. (a) Define the following terms

(i) Moment of force (01 mark)

(ii) Centre of gravity. (01 mark)

(b) (i) State the principle of moments. (01 mark)

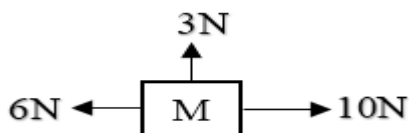
(ii) Describe an experiment to locate the Centre of gravity of an irregular object. (05 marks)

(c) A body of mass 50kg accelerates uniformly from rest and covers 40m in 8seconds. Calculate;

(i) The acceleration of the body (02 marks)

(ii) The momentum of the body after 8 seconds. (02 marks)

(d) In the figure below, forces 3N, 6N and 10N act on a body M of mass 2kg initially at rest.



Find the magnitude of the resultant force and the acceleration with which the body moves.

(04 marks)

2. (a) (i) What is meant by reflection of light? (01 mark)

(ii) State the laws of reflection of light. (02 marks)

(iii) Distinguish between diffuse and regular reflection of light (02 marks)

(b) Describe an experiment to show that light travels in a straight line. (05 marks)

(c) An object 4cm high is placed at right angle to the principal axis of a concave mirror of focal length 10cm. If the object is 30cm from the pole, find the;

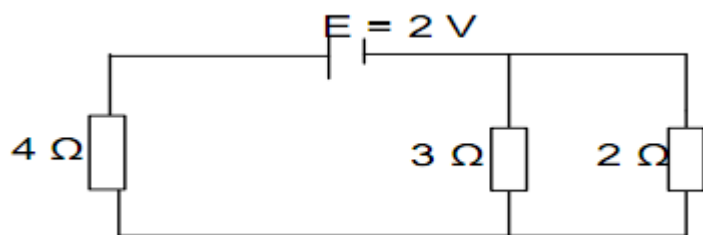
(i) position of the image. (02 marks)

(ii) Size of the image. (02 marks)

(d) State two applications of a diverging mirror (02 marks)

3. (a) Define the following terms as applied to machines.
- (i) Mechanical advantage (01 mark)
 - (ii) Velocity ratio. (01 mark)
 - (iii) Efficiency. (01 mark)
- (b) A pulley system has an efficiency of 60% and velocity ratio of 4. Calculate;
- (i) Its mechanical advantage. (02 marks)
 - (ii) The effort required to raise a load of 150N. (03 marks)
 - (iii) The distance moved by the load if the effort moves through a distance of 3m. (02 marks)
- (c) (i) Give, two reasons why the efficiency of the pulley is never 100%. (02 marks)
- (ii) Give two ways of improving the efficiency of a machine (02 marks)
 - (iii) Mention two applications of a pulley system in our daily life. (02 marks)
4. (a) (i) Define pressure and state its S.I units. (02 marks)
- (ii) Describe a simple experiment to show that pressure in a liquid increases with depth. (05 marks)
 - (iii) Calculate the pressure at the bottom of a swimming pool 1000cm deep. (density of water = 1000kgm^{-3}) (03 marks)
- (b) (i) State Pascal's principle (01 mark)
- (ii) Give two applications of Pascal's principle (02 marks)
- (c) (i) What is atmospheric pressure? (01 mark)
- (ii) Give two applications of atmospheric pressure. (02 marks)
5. (a) Differentiate between Kinetic energy and potential energy. (02 marks)
- (b) A ball of mass 100g falls from the top of a cliff 200cm high. Calculate the;
- (i) Potential energy possessed by the ball at the maximum height. (03 marks)
 - (ii) Velocity with which the ball hits the ground (03 marks)
- (c) (i) What is meant by the term diffusion (01 mark)
- (ii) State two factors on which diffusion depends (02 marks)
 - (iii) Describe an experiment to show diffusion in liquids. (05 marks)
6. (a) State Archimedes' principle. (01 mark)
- (b) An object weighs 70N in air, 30N when fully immersed in water and 50N when wholly immersed in a certain liquid. Calculate the;
- (i) relative density of the object (02 marks)
 - (ii) relative density of the liquid (02 marks)

- (iii) density of the liquid. (02 marks)
- (c) (i) Define momentum and state its SI unit (02 marks)
 (ii) State the principle of conservation of momentum. (01 mark)
- (d) A body **Q** of mass 3kg moving with a velocity of 10ms^{-1} collides with another body **P** of mass 2kg moving with a velocity of 5ms^{-1} in the same direction. If the two bodies move together after collision, calculate the;
- (i) Common velocity of the bodies after collision. (03 marks)
 (ii) Loss in kinetic energy. (03 marks)
7. (a) (i) What is meant by thermionic emission? (01 mark)
 (ii) State any two properties of cathode rays. (02 marks)
- (b) Draw a labeled diagram showing the essential parts of a cathode ray tube. (03 marks)
- (c) Define the following terms as applied to atomic physics
- (i) Atomic number (01 mark)
 (ii) Isotopes (01 mark)
- (d) The half-life of a radioactive substance is 24 hours. Find the time it will take 32g of the substance to reduce to 4g. (03 marks)
- (e) (i) State any one use of X-rays. (01 mark)
 (ii) State two health hazards caused by X-rays (02 marks)
 (iii) Give two differences between X-rays and cathode rays. (02 marks)
8. (a) Distinguish between primary and secondary cells and give one example of each. (04 marks)
- (b) State two precautions one has to undertake to prolong the life of a lead- acid accumulator (02 marks)
- (c) (i) Define the term internal resistance of a cell (01 mark)
 (ii) With the aid of a circuit diagram, describe how you can determine the internal resistance of a cell. (05 marks)
- (d) The figure below shows a cell of e.m.f 2V and negligible internal resistance connected to three resistors of resistances 4Ω , 3Ω and 2Ω .



Calculate the current supplied by the cell

(04 marks)