

NAME ----- INDEX NO-----

DATE _____ CANDIDATES SIGNATURE _____

232/2

PHYSICS

PAPER 2

(THEORY)

TIME; 2 HOUR

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided
- This paper consist of two section **A** and **B**
- Answer all questions in section **A** and **B** in the spaces provided
- All working must be clearly shown in the spaces provided in this booklet.
- Non- Programmable silent electronic calculators and **KNEC** mathematical tables may be used

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
A	1-12	25	
B	13	13	
	14	10	
	15	3	
	16	13	
	17	6	
TOTAL SCORE		80	

This paper consist of 9 printed pages candidates should check the questions paper to ascertain that all the pages are printed as indicated and that no questions are missing

SECTION A 25MARKS

1. The block of wood on the balance in the figure below is a cube of side 20cm Determine its density in kgm^{-3} (3mks)



2. The diagram below shows a pith ball in a flask. When a jet of air is blown over the mouth of the flask, the pith ball is found to rise from the bottom. Explain this observation (2mks)



3. It is observed that a smelly gas released at the back of the laboratory spreads faster on a hot day than on a cold day. Explain (1mk)

4. The diagram below shows a rod made of wood on one end and metal on the other end suspended freely with a piece of thread so that it is in equilibrium



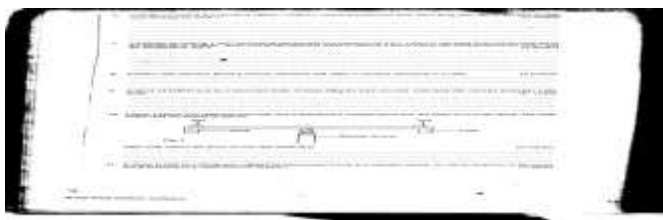
The side made of the metal is now heated with a Bunsen flame. State with reason the side to which the rod is likely to fit (2mks)

5. When a piece of metal is placed in water it sinks. But when the same piece of metal is placed on a block of wood it floats explain the observation (2mks)

6. A bullet traveling at a speed of 100ms^{-1} strikes a wall and penetrates 2cm. How long does the bullet take to stop after striking the wall? (3mks)

7. A balloon of volume 1.5m^3 containing helium gas at a pressure of $3.0 \times 10^6\text{pa}$ is released from the ground when the temperature is 20°C . What will be the pressure when it reaches a point where the volume becomes 3.0m^3 and the temperature 5°C (3mks)

8. Explain why mercury forms a convex meniscus and water a concave meniscus in a tube (2mks)
9. A force of 3500N acts on a stationary body of mass 20kg for 0.02 seconds. Calculate the velocity attained by the body (2mks)
10. The diagram below shows two identical iron rods, one is placed on a wooden block and the other on a metal block. The ends of the rods are heated as shown.



State with reason the piece of wax that melts first (2mks)

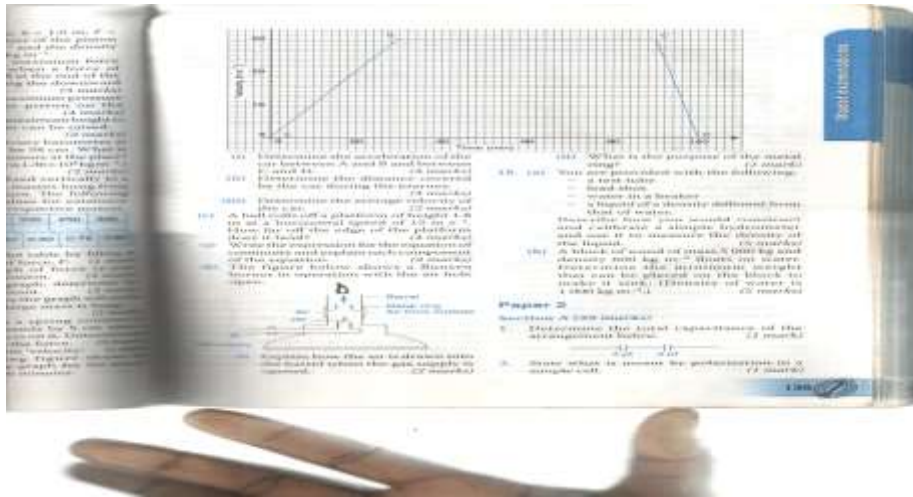
11. A stone is tied to a string and whirled in a horizontal circle at a constant speed. In which direction is the stone being accelerated at each point of its path? (1mk)

12. A force of 2.0N compresses a spring by 1.0mm. Determine the energy stored in the spring

SECTION B 55MKS

13. a) Define the term 'velocity'. (1mk)

b) The following figure shows velocity –time graph for the journey of a car in 100minutes.



i. Determine the acceleration of the car between A and B and between C and D (4mks)

ii. Determine the distance covered by the car during the journey (3mks)

iii. Determine the average velocity of the car (2mks)

- c) A ball rolls off a platform of height 1.8m at a horizontal speed of 15 ms^{-1} . How far off the edge of the platform does it land? (4mks)
14. A car of mass 2000kg travelling at 5 ms^{-1} collides with a minibus of mass 5000kg travelling in the opposite direction at 7 ms^{-1} . The vehicles stick and move together after collision. If the collision lasts for 0.1seconds;
- a) Determine the velocity of the system after collision of 3 decimal places. (3mks)
- b) Calculate the impulsive force on the minibus (3mks)
- c) Calculate the change in kinetic energy of the system (3mks)
- d) Explain the change in kinetic energy of the system (1mk)
15. a) What is the difference between longitudinal and transverse waves? (2mks)

b) The following figure shows a transverse wave travelling along the x-axis.



- i. Determine the wave length and the amplitude of the wave. (2mks)

- ii. If the time taken by the wave to move from O to A is 0.04 seconds, determine the frequency and the speed of the wavy (4mks)

c) A person stands between two vertical cliffs 400m from the nearer cliff. The cliffs are x distance apart.

Every time the person strikes the rock once, two echoes are heard, the first one after 2.5s and the second one 2.0 s later. Calculate

- i. the speed of the sound in air (3mks)

ii. the value of x (2mks)

16. a) The following figure shows an object, O , 3cm high placed in front of a concave mirror. C is the centre of curvature of the mirror.



By constructing a ray diagram, determine the size and the position of the image formed. (3mks)

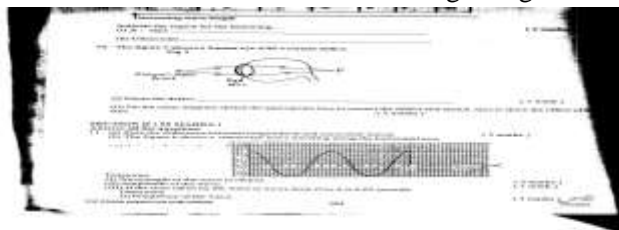
b) The table shows the object distance, u , and the corresponding image distance v , for an object placed in front of a concave mirror.

u (cm)	20	25	30	40	50	70
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v(cm)	20	16.7	15	13.3	12.5	11.6
(cm ⁻¹)						
(cm ⁻¹)						

- i. Complete the table by filling in the values of f and λ (2mks)
- ii. plot a graph of f (y-axis) against λ (5mks)
- iii. From the graph, determine the focal length of the mirror. (3mks)

17. The figure 6 shows a transverse wave travelling along the horizontal axis



determine

- i. Wave length of the wave in metres (2mks)

- ii. Amplitude of the wave (1mk)

iii. If the time taken by the wave to move from O to A is 0.02 seconds, determine the frequency of the wave (3mks)

