

NAME:

INDEX NO:

SCHOOL:

Candidate's signature:

Date:

232/1

PHYSICS

PAPER 1

JULY/AUGUST 2011

TIME: 2 HRS

LOWER YATTA DISTRICT JOINT EVALUATION EXAM- 2011

Kenya Certificate of Secondary Education (K.C.S.E)

232/1

PHYSICS

PAPER 1

(THEORY)

TIME: 2 HRS

INSTRUCTIONS

1. The paper consists of two sections, Section **A** and **B**.
2. Answer **ALL** the questions in section A and B in the spaces provided.
3. **ALL** answers and working **MUST** be clearly shown.
4. Mathematical tables and electronic calculators **may be** used.

Take acceleration due to gravity $g = 10\text{ms}^{-2}$

FOR EXAMINER'S USE:

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
1-10	25	
11	12	
12	13	
13	12	
14	10	
15	8	
TOTAL	80	

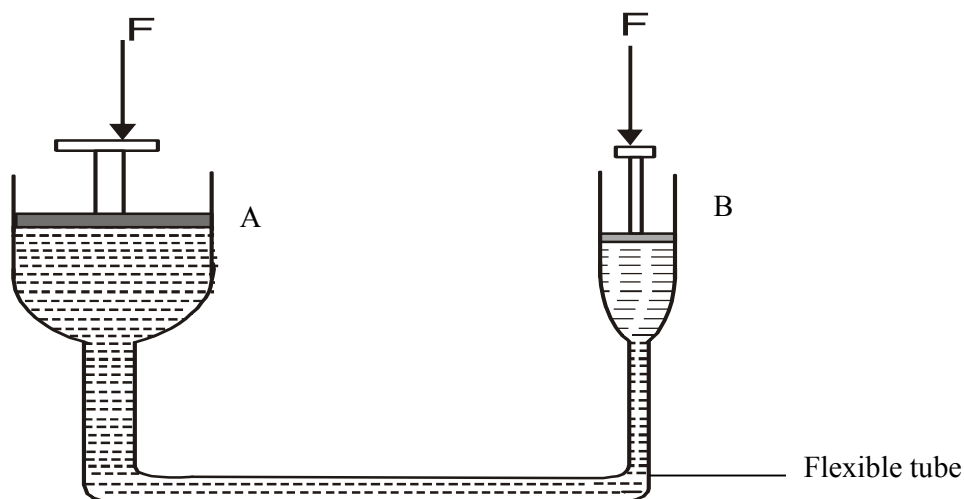
This paper consists of 12 printed pages

Candidates should check to ensure that all pages are printed as indicated and no questions are missing

SECTION (25 MARKS)

1. In an experiment to determine acceleration due to gravity, a student measured the period, T , and the length, of a simple pendulum. For a length of $L=70.5\text{cm}$, the period T obtained was 1.7sec . Given that $2\pi\sqrt{\frac{L}{g}}$, calculate the value of g correct to two significant figure. (3 Marks)

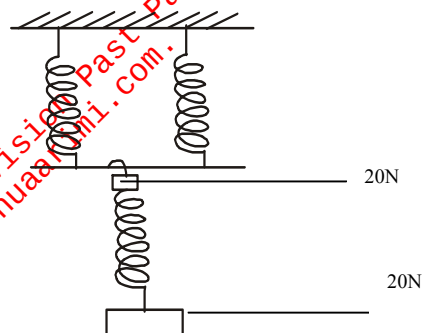
2. The figure below shows two cylinders containing a liquid and connected with a tight- fitting flexible tube.



The cylinders are fitted with air-tight pistons A and B as shown.

When equal forces, F , are applied on the pistons as shown, it is observed that the piston A moves up while B down. Explain this observation. (2 Marks)

3. The three springs shown in the figure below are identical and have negligible weight. The extension produced on the system of springs is 20cm.



Determine the constant of each spring.

(3 marks)

4. A turn table of radius 8cm is rotating at 33 revolutions per second. Determine the linear speed of a point on the circumference of the turntable.

(3 marks)

5. A steel needle when placed carefully on water can be made to float. When a detergent is added to the water it sinks. Explain this observation.

(2 marks)

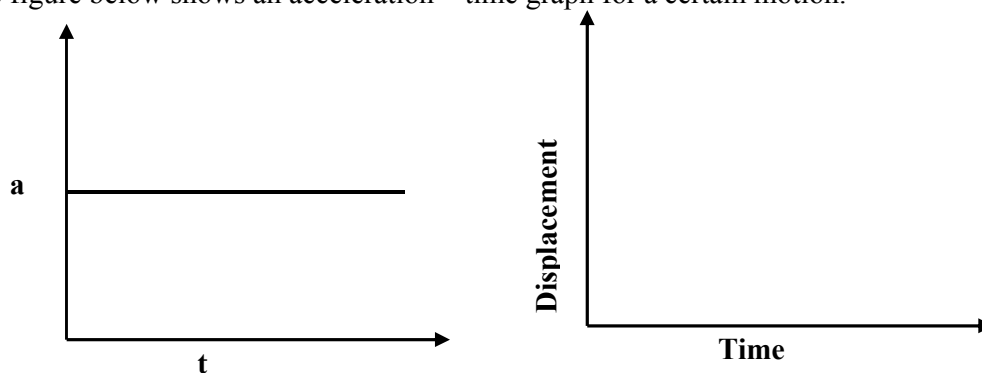
.....

.....

.....

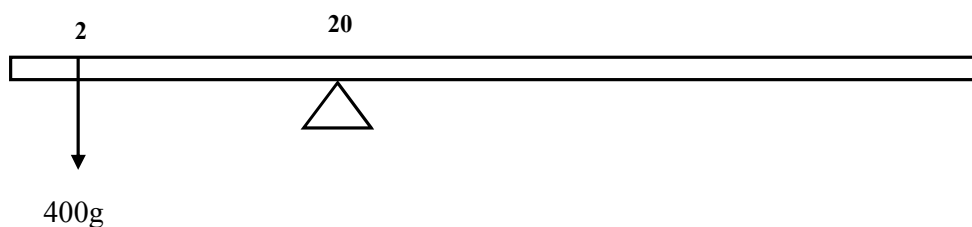
.....

6. The figure below shows an acceleration – time graph for a certain motion.



On the axes provided, sketch a displacement time graph for the same motion. (1 mark)

7. The figure below shows a uniform metre rule pivoted at the 20cm mark. It is balanced by a mass of 400g suspended at the 2cm mark as shown.



Determine the weight of the metre rule. (3 marks)

8. The weight of a solid in air is 5.0N. When it is fully immersed in a liquid of density 0.8gcm^{-3} , its weight is 4.04N. Determine;

a) The upthrust in the liquid. (1 mark)

b) The volume of the solid. (2 marks)

9. Bunsen burners are made with a wide heavy base. Explain.

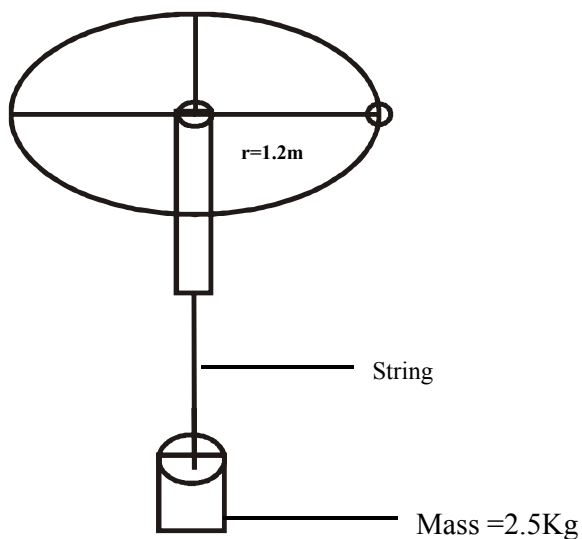
.....

.....

.....

.....

10. The figure below shows a mass of 400g connected by a string through a hollow tube to a mass of 2.5 Kg. The 2.5 Kg mass is kept stationary in the air by whirling the 400g mass round in an horizontal circle of radius 1.2m.

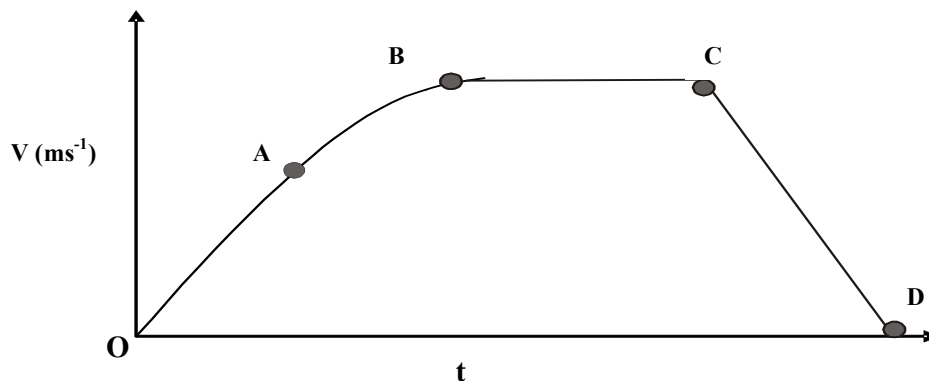


Determine the angular velocity of the 400g mass.

(3 marks)

SECTION B (55 MARKS)

11. a) The figure below shows a velocity time graph for a motion of a certain body.



Describe the motion of the region.

i) OA (1 mark)

.....

ii) AB (1 mark)

.....

iii) BC (1 mark)

.....

b) A car moving initially at 10ms^{-1} decelerates at 2.5m^{-2} .

i) Determine;

I. Its velocity after 1.5seconds. (2 marks)

II. The distance traveled in 1.5 seconds. (2 marks)

III. The time taken for the car to stop.

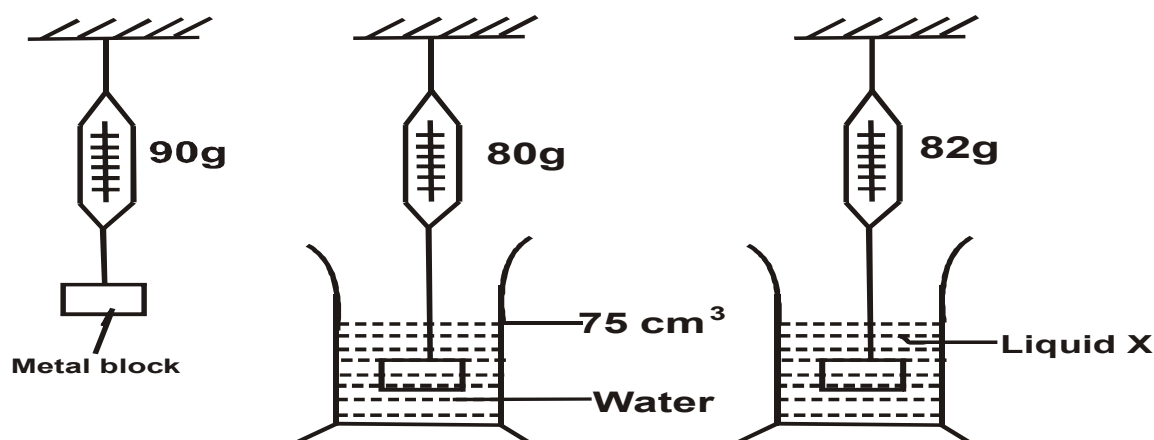
ii) Sketch the velocity-time graph for the motion of the car up to the time the car stopped. (1 mark)

iii) From the graph, determine the distance the car traveled before stopping. (2 marks)

12. a) i) State the law of floatation. (1 mark)

.....
.....

ii) The diagram below shows the same metal block weighed in air, water and liquid X.



i. Calculate the density of the metal.

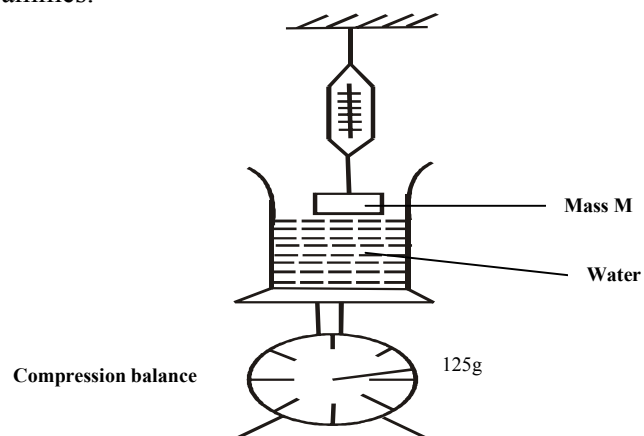
ii. What was the level of water before the solid was immersed.

(2 marks)

iii. Calculate the density of the liquid X.

(2 marks)

b) Mass M shown in the diagram below is a block of glass of mass 25g. The spring balance is lowered so that M is completely immersed in the water. The reading on the spring balance is 15 grammes.



i) Determine the density of glass block.

(2 marks)

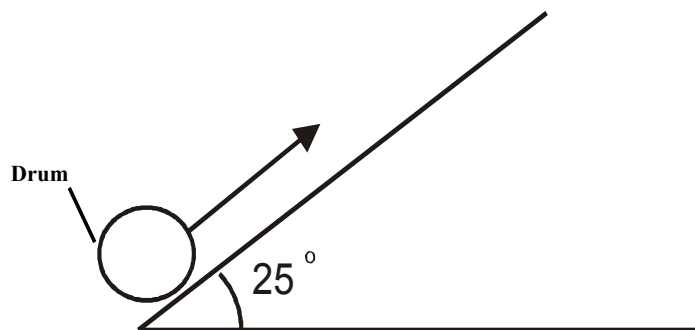
ii) What is the new reading on the compression balance?

iii) If the string supporting M is finally slackened, what is the new reading on the compression balance? (2 marks)

13. a) Define the term efficiency of a machine. (2 marks)

.....
.....
.....

b) The figure shows a drum of mass 90Kg being rolled up a plane inclined at 25° to the horizontal. The force F applied is 420N and the distance moved by the drum along the plane is 5.2m.



Determine

i) The work done by the effort. (3 marks)

ii) The work done in raising the drum.

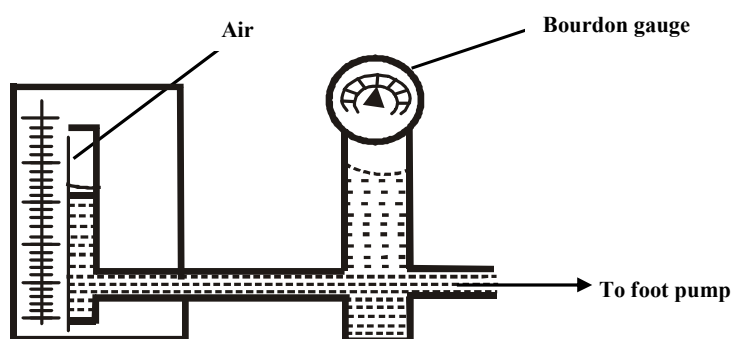
iii) The efficiency of the inclined plane.

(3 marks)

iv) Why is the efficiency never 100.

(1 mark)

14. a) The figure below shows a simple set up for verifying boyle's law.



Describe how the apparatus may be used to verify Boyle's law.

(4 marks)

.....

.....

.....

.....

.....

b) The results shown in the table were obtained in an experiment to verify Boyle's law.

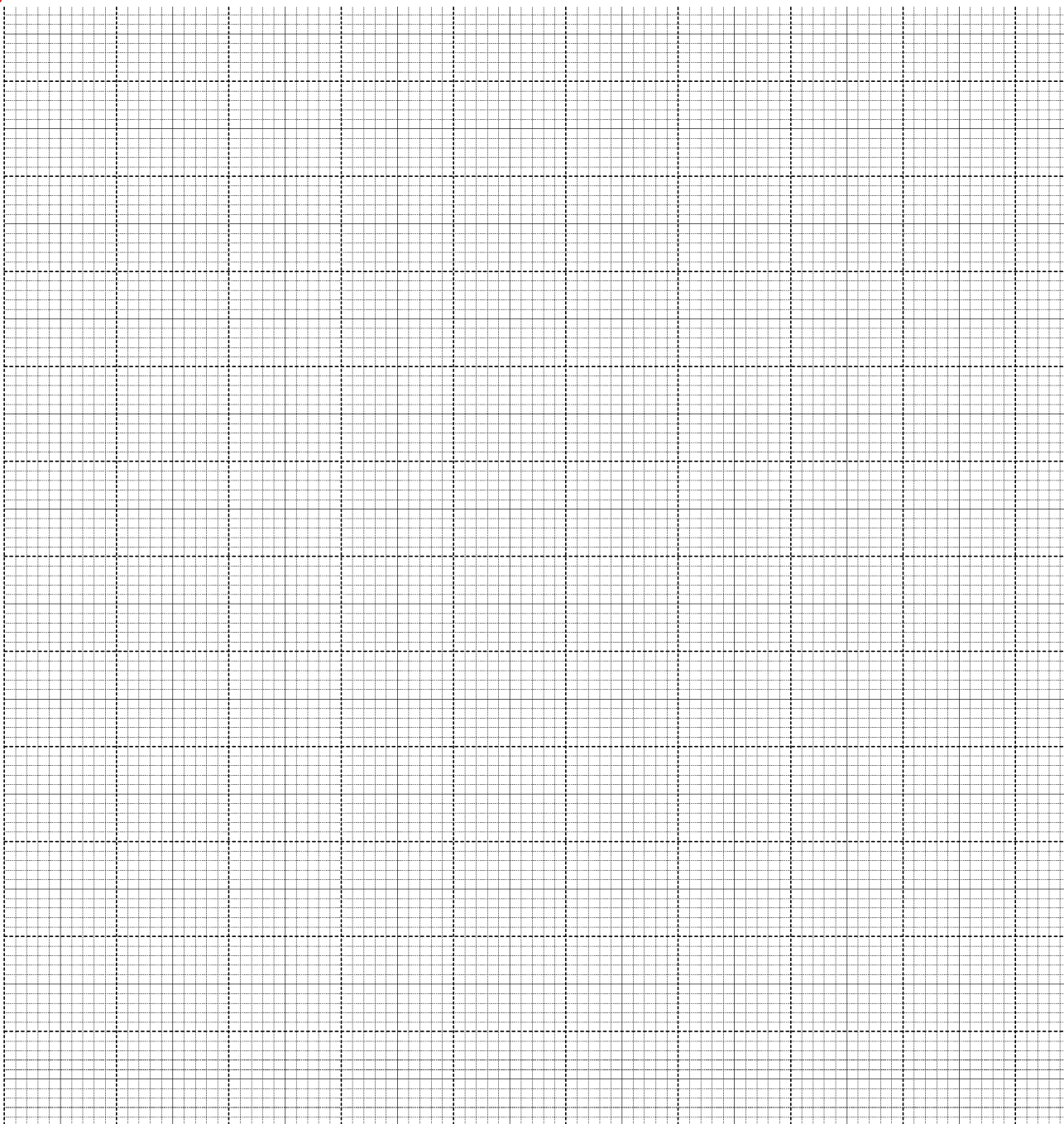
Pressure /Mmm ⁻²	400	320	160	80
Volume mm ⁻³	2.0	2.5	5.0	10.0
$\frac{1}{\text{Volume}}$				

i) Copy the table and complete it.

(2 marks)

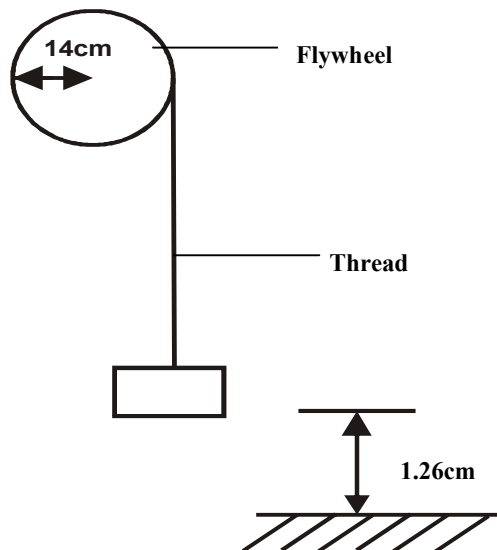
ii) Plot a graph of pressure (Nmm⁻²) against $\frac{1}{\text{Volume}}$ mm⁻³.

(4 marks)



15. a) A rubber is inflated to pressure of $2.7 \times 10^5 \text{ pa}$. And volume of 3800 cm^3 at a temperature of 25° C . It is then taken to another place where the temperature is $2.5 \times 10^5 \text{ pa}$. Find the new volume.
(4 marks)

- b) The figure below shows a flywheel of radius 14 cm suspended about a horizontal axis through its centre so that it can rotate freely about the axis. A thread is wrapped round the wheel and a mass attached to its loose end so as to hang at a point 1.26 m above the ground.



When the mass is released, it accelerates at 0.28 m/s^2 . Determine the angular velocity of the wheel just before the mass strikes the ground.
(4 marks)