URANGA PHYSICS EXAMINATIONS

Kenya Certificate of Secondary Education

JOINT EXAMINATIONS 2021

FORM 1 PHYSICS

(General Paper)

June 2021 – TIME 2 Hours

Name: ……..…… **Adm No**: ……**Class**…..**...**
Candidate's Signature: ……..…….. **Date**: ……/07/2021.

INSTRUCTIONS TO CANDIDATES

1) *Write your name and your admission number in the spaces provided above.*
2) *Write the date and your signature.*
3) *This paper consists of two sections; **A** and **B***
4) *Answer **all** questions in section **A** and **B** in the spaces provided.*
5) *All working **must** be clearly shown in the spaces provided in this booklet.*
6) *Non programmable silent electronic calculators may be used.*
7) *This paper consists of **11 printed pages**.*
8) ***Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.***
9) ***Candidates should answer the questions in English**.*

FOR EXAMINER'S USE ONLY

Section	Question	Maximum score	Candidates score
A	1-12	25	
B	13	16	
	14	08	
	15	14	
	16	07	
	17	10	
	TOTAL SCORE	**80**	

SECTION A: 25 MARKS

1. Thermodynamics is a branch of physics. State what it deals with. (1 mark)

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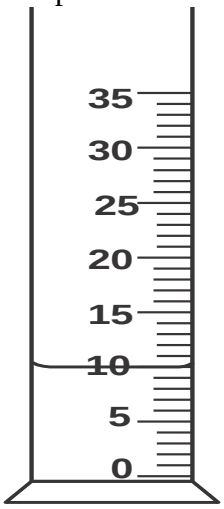
2. The figure below shows water placed in a measuring cylinder calibrated in cm^3



i) An object of mass 150 g and density $10g/cm^3$ is lowered gently in water. Calculate the volume of the object. (3 marks)

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ii) Indicate on the diagram the new level. (1 mark)

3. State **two** differences between mass and weight. (2 marks)

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4. A solid weighs 18.36N on the surface of the moon. The force of gravity on the moon is $1.7Nkg^{-1}$. Determine the mass of the solid. (3 marks)

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5. A bottle containing a smelling gas is opened at the front bench of a classroom. State the reason why the gas is detected throughout the room. (1 mark)

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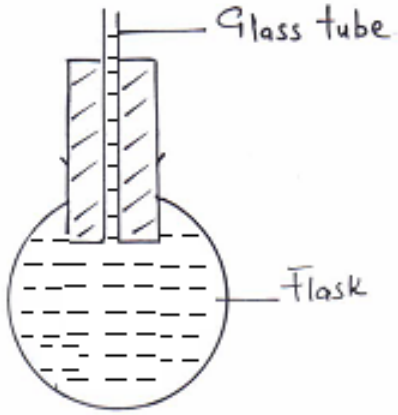
6. The figure below shows a flask filled with water. The flask is fitted with a cork through which a tube is inserted. When the flask is cooled, the water level rises slightly, and then falls steadily.



Explain this observation. (3marks)

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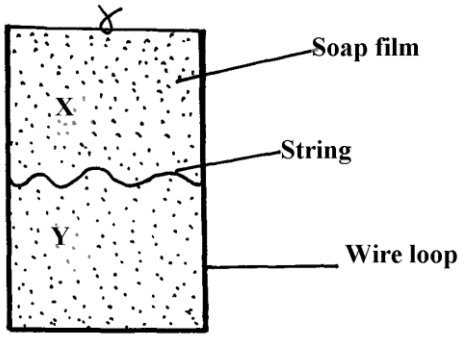
7. The figure below shows a wire loop with a string that has been dipped into soap solution.



i) Sketch a similar diagram to show the observed effect if the soap film is punctured at X.

(1 mark)

ii) Explain the observations made in **(i)** above. (2 marks)

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8. List two forces that act on objects without contact. (2 marks)

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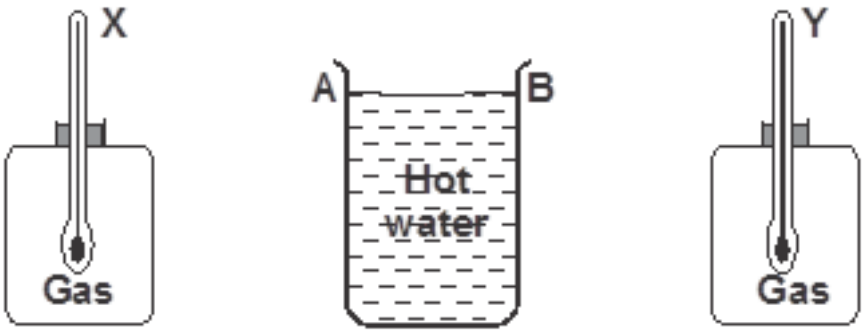
9. The figure below shows a cylindrical container having hot water at 95^{o}C. End A is shiny while end B is dull black. At equal distances from the container is placed two identical gas jars fitted with thermometers X and Y.



Compare the readings of the two thermometers after two minutes. (1 mark)

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10. Give a reason for your answer in question **9** above. (1 mark)

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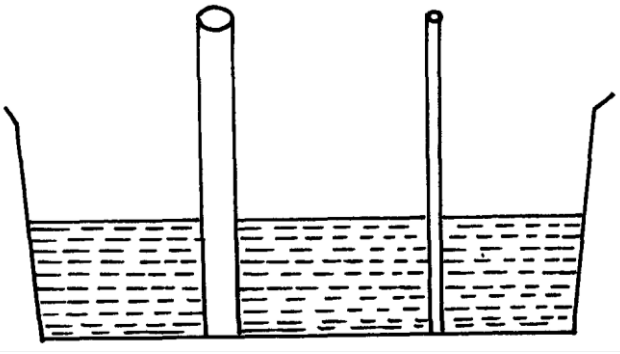
11. The figure below shows two glass tubes of different size of bore, dipped in a glass beaker half full of water



a) Complete the diagram to show how water will rise up in the two glass tubes. (1 mark)

b) Give a reason for your answer in a) above. (1 mark)

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12. A student wearing sharp pointed heeled shoes is likely to damage a soft wooden floor. Explain. (2 marks)

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SECTION B: 55 MARKS

13.

a) Define pressure and state its SI unit. (2 marks)

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b) State three factors that affect pressure in liquids. (3 marks)

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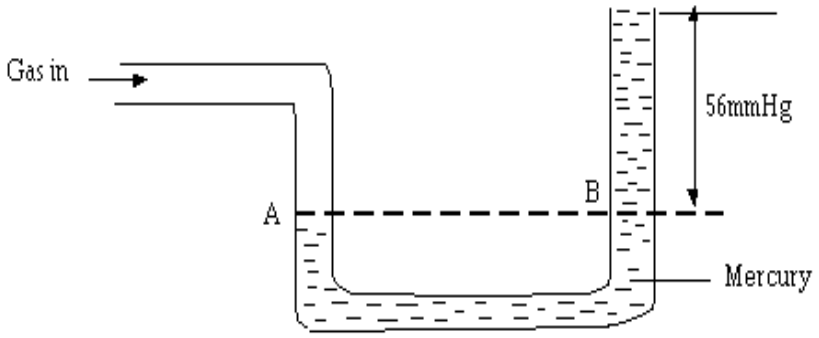
c) Use the figure below to answer the questions that follow.



If the atmosphere pressure is 760mm of mercury, calculate the value of gas pressure in SI unit? (Density of mercury=13600kg/m^3) (4 marks)

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d) State the principle of transmission of pressure in liquids. (1 mark)

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e) State two properties of a liquid that can be used as a brake fluid. (2 marks)

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f) Give a reason why water is not used as a barometric fluid. (1 mark)

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g) The figure below shows two cylinders of different cross-sectional areas connected with a tube. The cylinders contain an incompressible fluid and are fitted with pistons of cross-sectional areas 4cm and 24cm^2.

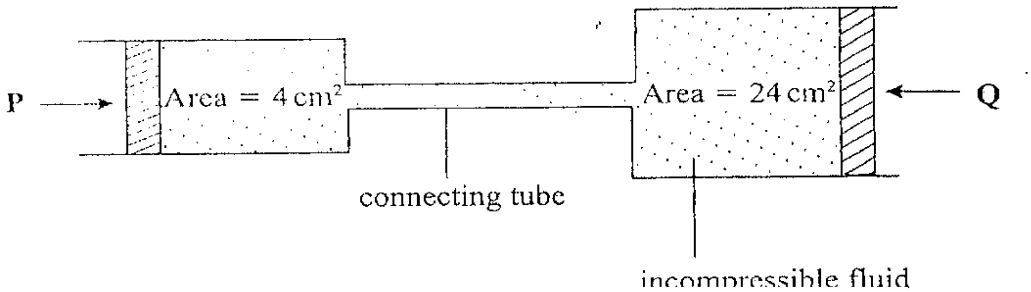

Figure 8

Opposing forces P and Q are applied to the pistons such that the pistons do not move.

If the pressure on the smaller piston is 5N/cm^2, determine force Q. (3 marks)

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14. An empty density bottle has a mass of 10g when empty. The mass of the bottle when full of water is 20gand 26g when full of liquid **p**. Calculate:

a) Mass of water. (2 marks)

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b) Volume of water (density of water=1g/cm^3). (2 marks)

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c) Mass of liquid **p.** (2 marks)

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d) Density of liquid **p** (2 marks)

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15.

a) State two factors that affect the rate of diffusion in gases. (2 marks)

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b) Brownian motion of smoke particles can be studied by using the apparatus shown in the figure shown below. To observe the motion, some smoke is enclosed in the smoke cell and then observed through the microscope.

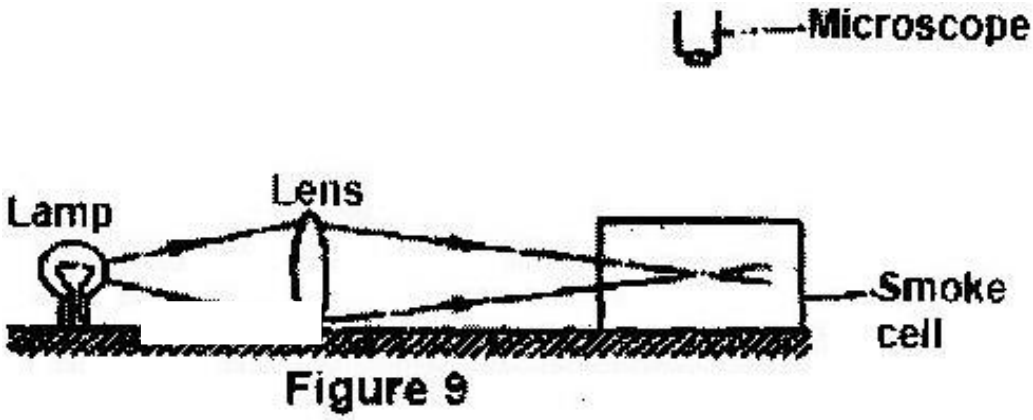

Figure 9

i) Explain the role of the **smoke particles, lens** and **microscope** in the experiment. (3 marks)

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ii) State and explain the nature of the observed motion of the smoke particles. (3 marks)

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iii) State what will be observed about the motion of the smoke particles if the temperature surrounding the smoke cell is raised slightly. (1 mark)

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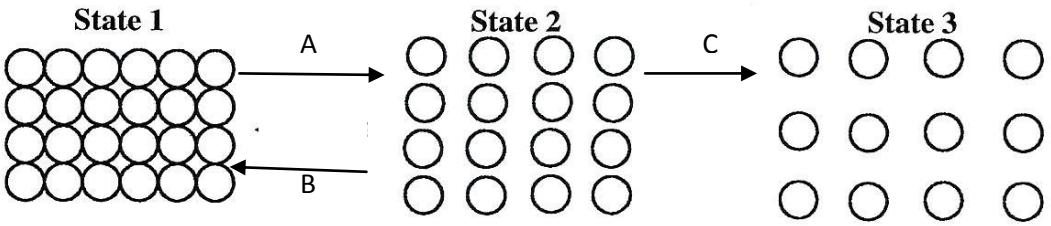
c) The figure below shows the arrangement of molecules in the three states of matter.



i) Name the process represented by the arrows. (3 marks)

A……

B……

C……

ii) State two differences between state 2 and state 3 in terms of **forces** and **distances** between the molecules. (2 marks)

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16.

a) State two effects of anomalous expansion of water. (2 marks)

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b) Sketch a graph of volume against temperature of water from $\mathbf{0^0C}$ to $\mathbf{10^0C}$. (2 marks)

c) State three properties of a thermometric liquid. (3 marks)

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17.

(a) Convert: (3 marks)

I. 285K into ^{0}C

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II. 19^{0}C into K

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(b) State two ways of increasing the sensitivity of a thermometer. (2 marks)

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(c) Differentiate between good and poor thermal conductors, name one type of a good conductor. (2 marks)

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(d) State three factors affecting thermal conductivity in solids. (3 marks)

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