NAME: .....INDEX NO:.....

SCHOOL: .....SIGN:.....

DATE: .....

232/1
PHYSICS
Paper I
Theory
JULY/AUGUST-2018
Time: 2 Hours

FORM FOUR MID-YEAR EVALUATION EXAMINATION – 2018

Kenya Certificate of Secondary Examination (KCSE)

232/1
PHYSICS
Paper I
Theory

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided above.
- Answer all the questions both in section **A** and **B** in the spaces provided below each question
- All workings must be clearly shown,
- Mathematical tables and silent electronic calculators may be used.
- Take : Acceleration due to gravity, g $10m/s^2$
  Density of water = Ig/cm^3

For examiner's use only

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
Section A	1-13	25	
Section B	14	11	
	15	08	
	16	12	
	17	11	
	18	13	
	TOTAL	**80**	

This paper consists of 11 printed pages Check the Question paper to ensure that all pages are printed as indicated and no question are missing.

SECTION A (25 MARKS)

Answer ALL the questions in this section in the spaces provided

1. (a) Draw a diagram to represent a scale of a micrometer screw gauge of thimble scale 50 divisions and reading 3.68mm. (2mks)

(b) Determine the actual reading if the micrometer screw gauge above has a zero error of 0.03mm. (1mk)

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2. State why braking systems use Liquid and not gases. (1mk)

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3. The figure 1 below shows the level of mercury and water in a beaker.

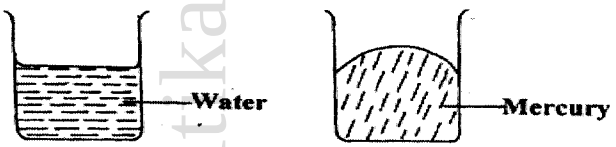

Fig 1

Explain the difference in the shape of the meniscus. (1mk)

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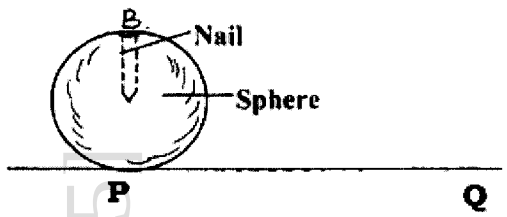
4. The figure 2 below shows a wooden sphere with a nail hammered into it at point H as shown below.

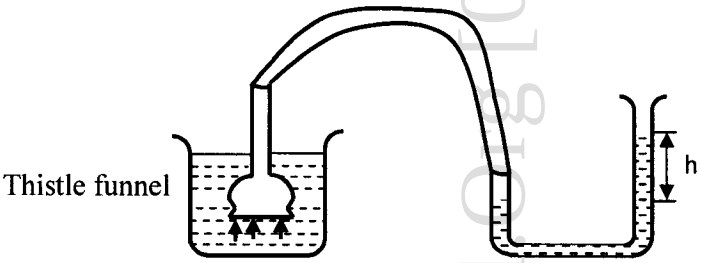
Fig 2



The sphere is rolled on a horizontal ground and comes to rest after sometime at point Q.

Draw the sphere after it comes to rest at point Q (1mk)

5 The diagram below shows a set up used by a student to show variation of pressure in a liquid . State and explain the effect on the height, h, when the thistle funnel used moved towards the surface of the liquid. (2 mks)



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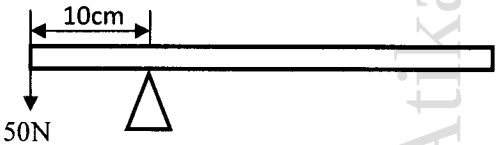
b)A uniform half metre rod is balanced on a knife edge by a force of 50N placed as shown in the figure below.



Determine the weight of the rod (2mks)

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6. What is the safe speed a motorist should drive at on a level bend of radius 96m if the co-efficient of friction between the road and the tyres is 0.36m? (2mks)

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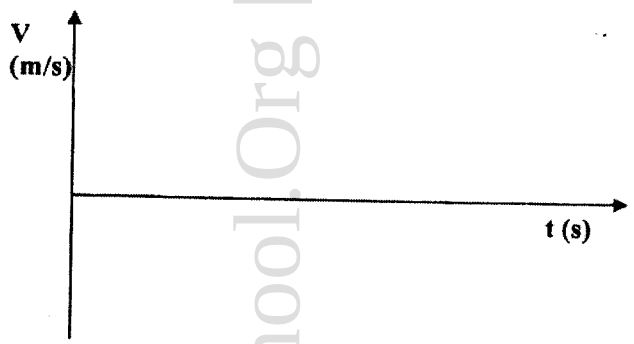
7. A roller coaster has a vertical loop of radius 12m. The cars hurtle round the loop at $14ms^{-2}$ what point in the loop does the passenger feel heaviest. (1mk)

8. Sketch on the axis provided below a velocity - time graph of a motion of a stone thrown vertically upward from the edge of a platform and eventually the stone lands without bouncing on the groundbelow the platform. (1mk)



9. The figure 4 below shows two light sheets of paper arranged as shown.

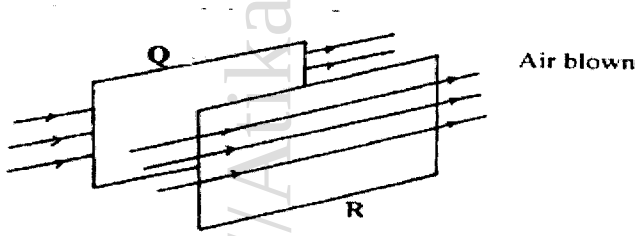


Fig 4

State what is observed if strong air is blown at the same time behind paper Q and in front of paper as shown (1mk)

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15. A certain substance contracts when heated at a certain temperature and expands when cooled at the same temperature.

(i) Name the substance (1mk)

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(ii) State one disadvantage of this behaviour. (1mk)

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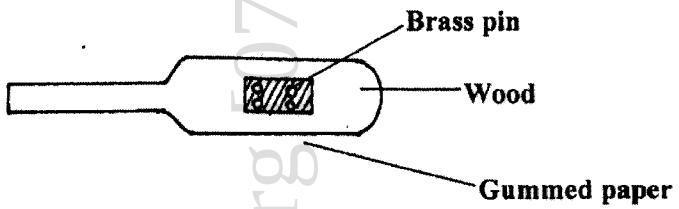
(b) The figure 6 below shows four brass pins pressed on a cooking stuck until they are flat on the wood. A white gummed paper was then stuck on the wood covering the pins. The stick was then passed over a Bunsen flame a few times.



It was observed that the paper got charred leaving four white spots. Explain this observation. (1mk)

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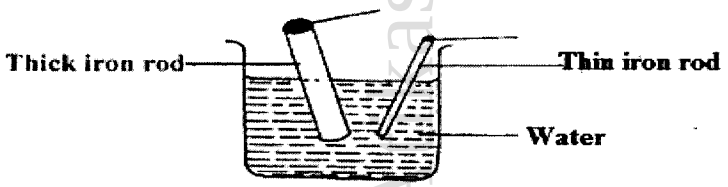
(c) The figure 7 below shows an experiment carried out by form one student.

Fig 7



(i) The students dipped two iron rods of the same length but of different thickness into a beaker of hot water at the same time. What was the experiment about? (1mk)

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(ii) State and explain the observations made after about 10 minutes. (2mks)

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(iii) If the two rods were much longer, state and explain any difference from C (ii) above that would be made in the observation. (2mks)

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16. (a) Explain why a gas exerts increased pressure when it is compressed into a small space. (2mk)

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(b) State the law that relates the volume of a gas to the temperature of the gas. (1mk)

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(c) A balloon is filled with air to a volume of 200ml at a temperature of 293K. Determine volume when the temperature rises to 353K at the same pressure.

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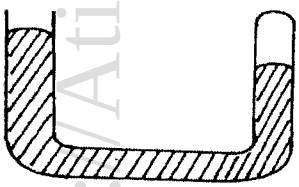
(d) To verify Boyle's law a set-up consisting of a U-tube was made as shown in the figure 8 below. The tube contains mercury with air in the sealed end.



(i) Explain what is observed when more mercury is added. (2mks)

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(ii) Suggest a method used to maintain the temperature of air constant in the experiment. (1mk)

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e) (i) Explain why Boyle's law would not hold for gases such as methane, (1mk)

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(ii) Sketch the graph of pressure against volume for an ideal gas. (2mks)

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17. State the Archimedes's principle. (1mk)

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(b) You are provided with the following apparatus;

- A spring balance
- A small piece of metal
- Eureka can
- A beam balance
- A string
- A beaker
- A retort stand
- Some water.

With the aid of a well labeled diagram, describe an experiment you would perform in the laboratory using the above apparatus to verify Archimedes's principle for a totally immersed body. (7mks)

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(c) A simple hydrometer has a cylindrical cross-sectional area of $2.0cm^2$ and weighed to have a total mass of 15g. What length of the hydrometer is immersed when it floats on water of density:1.0 g/cm^3? (3mks)

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18. (a) What is specific latent heat of fusion? (1mk)

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(b) State two factors which affect freezing point of a substance. (2mks)

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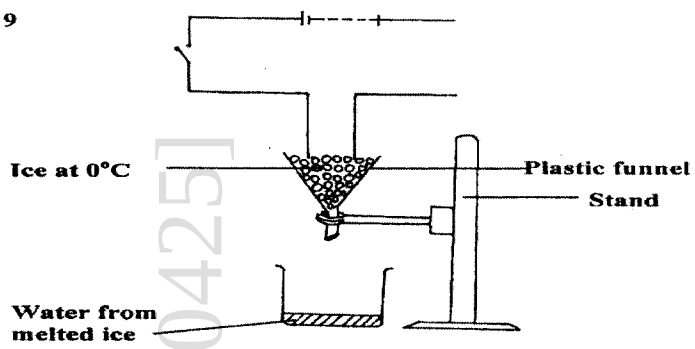
(c) Figure 9 below illustrates an experiment in which electrical energy is used to determine specific latent heat of fusion.

Fig 9



(i) Other than time, state other measurements that would be used to determine the quantity of heat Q,absorbed by ice in unit time. (2mks)

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(ii) Complete the circuit to show connection of the essential circuit components.(3mks)

(iii) Describe how the experiment can be used to determine the latent heat of' fusion of a substance (2mks)

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(d) In a similar experiment, the following readings were obtained when the heater was switched on for 5 minutes

Voltmeter reading = 6.0V

Ammeter reading = 1.25 A

Temperature rise reading = 10°C

If by the end of the experiment, 200g of water at 0°C was collected determine the latent heat of fusion of ice. (3mks)

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