Name...Index No...............Class......Adm.No...........

ALLIANCE HIGH SCHOOL
TRIAL EXAMINATION - 2014
PHYSICS PAPER 1
232/1
# TIME: 2 HRS

INSTRUCTIONS TO CANDIDATES

- This paper consists of **TWO** sections; Section **A** and **B**.
- Answer **ALL** the questions in both sections in the spaces provided.
- All working **MUST** be clearly shown.
- Mathematical tables, Electronic calculators and slide rules may be used.

FOR EXAMINERS' USE ONLY.

Section	Question	Maximum Score	Candidate's Score
A	1 - 12	25	
B	13	5	
	14	11	
	15	10	
	16	09	
	17	08	
	18	12	
Total Score		80	

Section A -25mks.

1.   In an experiment to determine the density of a liquid the readings shown in the diagram below were noted
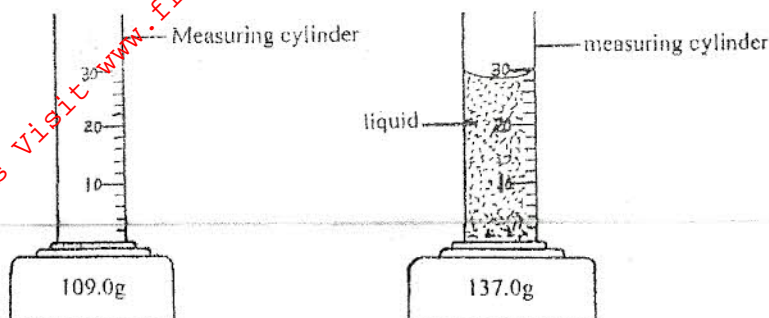
Calculate the density of the liquid   (2mks)

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2.   Rain drops are spherical while water droplets on a glass surface are flat. Explain this statement   (2mks)

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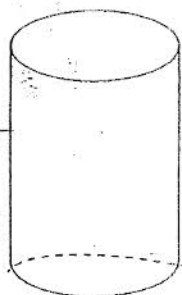
3.   A body of mass 6kg and density 8000kgm^{-3} is completely immersed in a liquid of density 900kgm^{-3}. Find the upthrust force acting on the body.   (2mks)

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4.   The figure below shows a uniform cylindrical solid. Locate its centre of gravity.   (1mk)

5. A balloon is filled with hydrogen. It is observed to rise in air upto a certain height. Explain why it stops to rise (1mk)

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6. 50 drops of oil have a volume of 12mm³. One drop of such oil on a water surface forms a film of radius of 1.4cm.

      (a) Determine the thickness of the film (2mks)

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      (b) State one assumption made when performing this experiment. (1mk)

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7. A spring is compressed by 4cm with a force of 20N. Calculate the stored potential energy in the spring. (3mks)

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8. A riffle of mass 4kg fires a bullet of mass 15.0g with a muzzle velocity of 700m/s. assuming that the riffle is free to move. Find the recoil velocity of riffle. (3mks)

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9. Calculate the weight of a thread of mass 0.6mg. (Take g = 10N/kg) (2mks)

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10. An object is released from a height of h. If the acceleration due to gravity is g, express the velocity of the stone in terms of h and g, just before hitting the ground. (2mks)

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11. A metre rule is balanced by masses 18g and 12g suspended from its ends. Find the position of its pivot. (3mks)

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12. State one way of increasing sensitivity of mercury – in glass thermometer. (1mk)

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Section –B (55 mks)

13. The diagram below shows a six's maximum/minimum thermometer
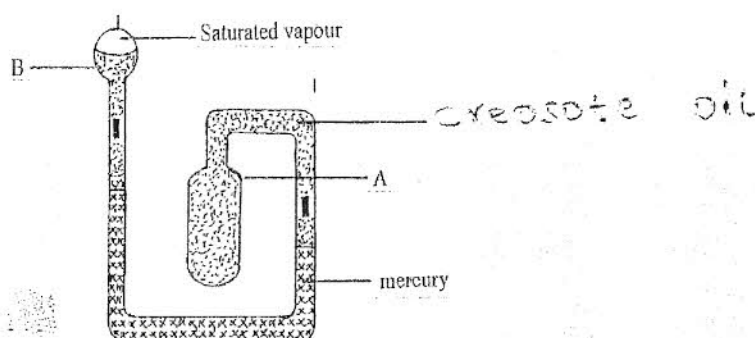
(a) What is the thermometric liquid in this thermometer? (1mk)

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(b) Why is it necessary for the vapour in bulb B to be saturated? (1mk)

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(c) Explain how the thermometer indicates maximum and minimum temperature. (3mks)

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14. (a) The figure below shows a velocity –time graph for the motion of a certain body.
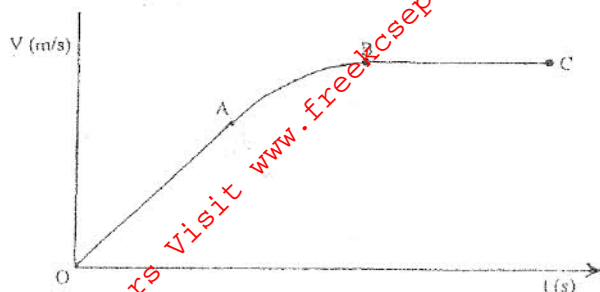
Describe the motion of the body in the region:

(i) OA: (1mk)

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(ii) BC: (1mk)

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(b) A car moving initially at 10m/s decelerates uniformly at 2.5m/s²

Determine:

(I) its velocity after 1.5 seconds (2mks)

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(II) the distance travelled in 1.5 seconds (2mks)

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(III) the time taken for the car to stop (2mks)

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(IV) Sketch the velocity – time graph for the motion of the car up to the time the car stopped. (1mk)

(v) From the graph determine the total distance the car travelled before stopping. (2mks)

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15. (a) What is meant by specific latent heat of vaporisation? (1mk)

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(b) In an experiment to determine the specific latent heat of vaporisation of water, steam at 100^0C was passed into water contained in a well lagged calorimeter. The following measurements were obtained;

Mass of calorimeter = 50g

Initial mass of water = 70g

Initial temperature of water = 5^0C

Final mass of water + calorimeter + condensed steam = 123g

Final temperature of mixture = 30^0C

Specific heat capacity of water = 4200J $Kg^{-1}K^{-1}$

Specific heat capacity of copper = 390 $JKg^{-1}K^{-1}$

Determine

(i) Mass of condensed steam (1mks)

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(ii) Heat gained by water and calorimeter (3mks)

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(c) Given that L is the specific latent heat of vaporization of steam above.

(i) Write down in terms of L an expression for the heat given out by steam. (1mk)

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(ii) Determine the value of L (2mks)

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(d) 500g of water at 20°C is mixed with 200g of water at 55°C. Find the final temperature of the mixture (2mks)

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16 .(a) State Archimedes principle. (1mk)

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(b) Give a reason why a hydrometer has a thin stem (1mk)

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(c) A rod of uniform cross-sectional area of $4.0cm^2$ and length 16cm floats vertically upwards in a liquid whose density is $1.2g/cm^3$. It has 8cm of its length above the surface.

Determine

(i) The mass of the rod. (2mks)

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(ii) The depth to which it will submerge if put in a liquid whose density is $1.0g/cm^3$ (2mks)

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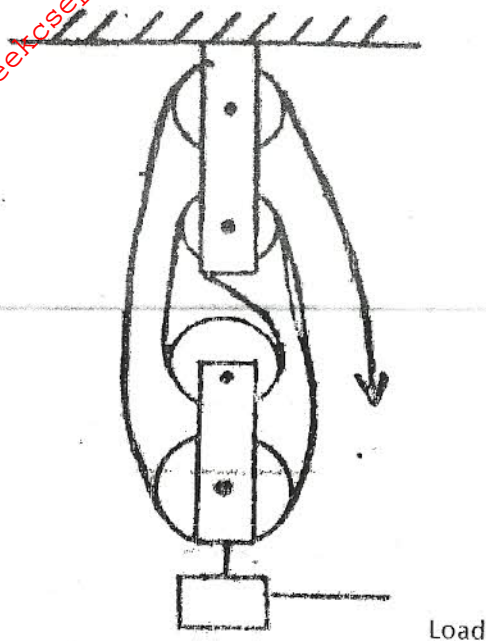
(d) The figure below shows a piece of cork held with a light thread attached to the bottom of

the beaker. The beaker is filled with water
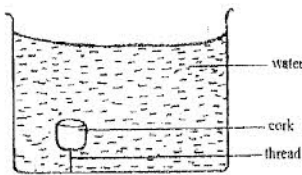
(i) On the diagram indicate the forces acting on the cork. (2mks)

(ii) Show how the forces are related. (1mk)

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17. The diagram below shows a pulley system. If its efficiency is 80%

Load

(i) Find the mechanical advantage (2mks)

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(ii) The load that can be lifted with an effort of 400N. (2mks)

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(iii) Work done if the load is lifted through a vertical distance of 3.5m (2mks)

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(iv) Average rate of working if the work is done in 1.5 minutes (2mks)

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18.a.) The table below gives the centripetal force F acting on the body in a circle of radius 1m for different speeds V of the body

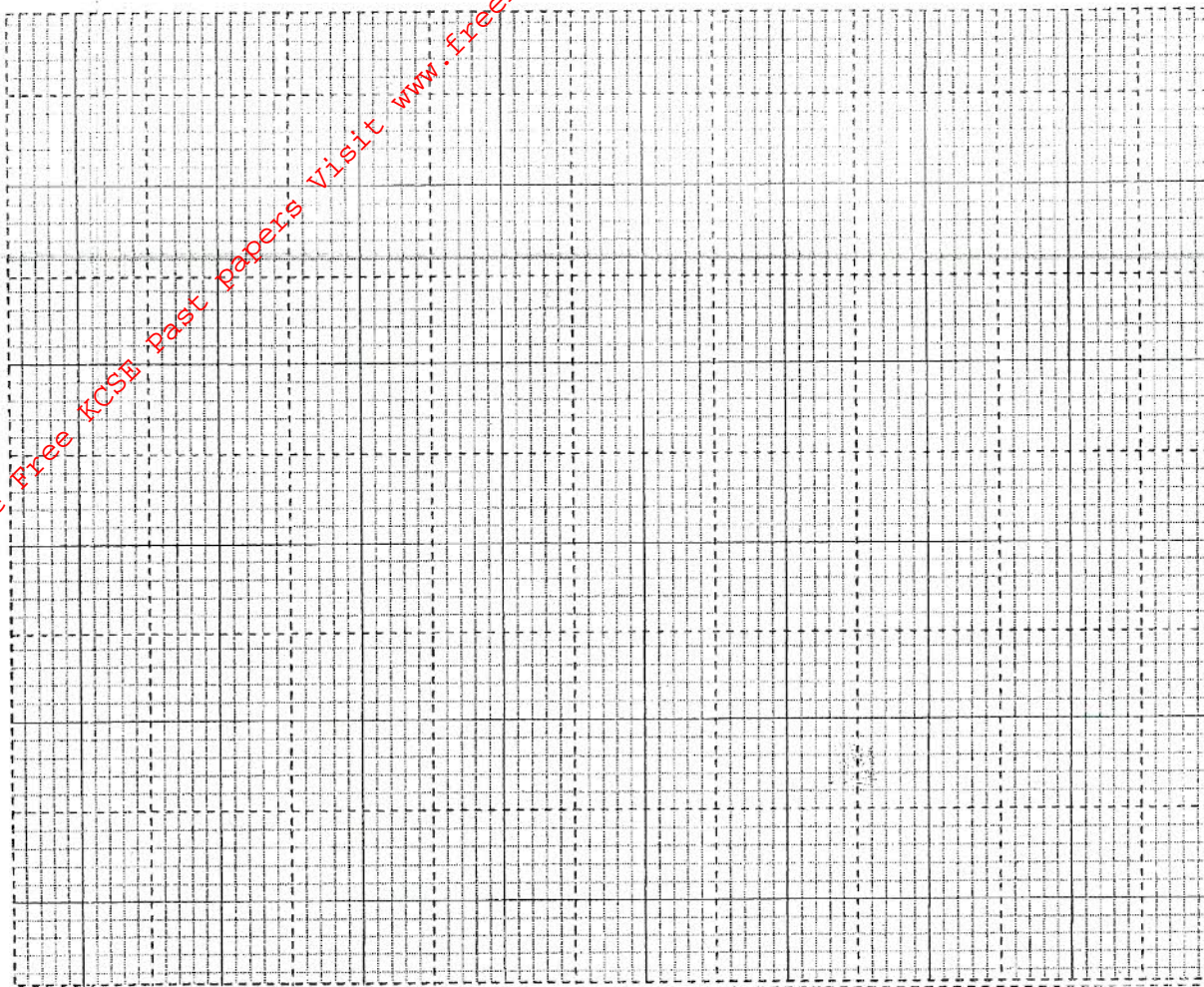| Force F (N)	0.4	1.6	3.6	6.4	10.0	14.4
Speed V (m/s)	1.0	2.0	3.0	4.0	5.0	6.0
V^2 (m^2/s^2)						

(i) Complete the table (1mks)

(ii) Plot a graph of F against V^2 (5mks)

(iii) Use the graph to determine the mass of the body. (2mks)

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b.) A car is negotiating unbanked circular track. State two factors that will determine the critical speed of the car. (2mks)

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(b) Given that the car above has a mass of 1000kg and the circular path has a radius of 25m. Determine the maximum speed with which the motorist can travel so as not to skid if the frictional force between the tyres and the road is 6500N. (2mks)

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Physics Departmert.