Name……. **Index No…….……**

School…… **Candidates Signature……**

Date ……..…..

232/1
PHYSICS
Paper 1
(Theory)
July/August 2010
2 Hours

BUNGOMA JOINT EVALUATION TEST - 2010

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

Instructions to Candidates

- *Write your name and index number in the spaces provided above.*
- *Sign and write the date of the examination in the spaces provided above*
- *This paper consists of **two** sections **A** and **B.***
- *Answer all the questions in section **A** and **B** in the spaces provided*
- *All working **MUST** clearly be shown in the spaces provided in this booklet.*
- *Take: acceleration due to gravity, $g = 10m/s^2$*
  Atmospheric pressure = 1.0×10^5 pa.

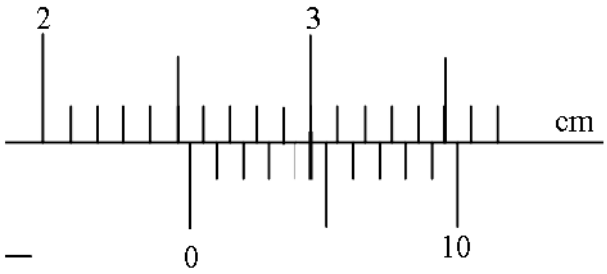
FOR EXAMINER'S USE ONLY

Section	Question (s)	Max. Score	Candidates Score
A	1 – 14	25	
B	15	08	
	16	11	
	17	12	
	18	13	
	19	11	
	Total	**80**	

SECTION A (25 MARKS)

Answer ALL questions in this section

1. The vernier caliper in the figure below has a zero error of -0.05cm



State the actual reading of the measuring instrument. (2mks)

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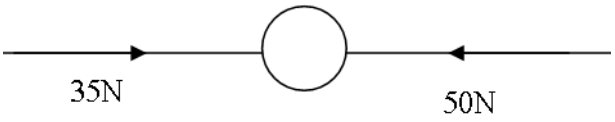
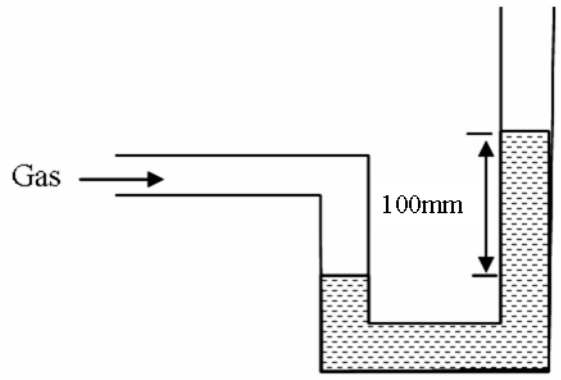
2. Using a scale of 1cm to represent 10N, draw a diagram to show the direction and magnitude of the resultant force for two forces acting as shown below (1mk)



3. The figure below shows an open-ended manometer connected to a gas supply.



If the mercury barometer reads 760mm, calculate the pressure of gas in the cylinder (density of water = 1g/cm^3, density of mercury = 13.6g/cm^3) (3mks)

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4. In an experiment to demonstrate Brownian motion, smoke was placed in an air cell and observed under a microscope. Smoke particles were observed to move randomly in the cell. Explain the observation. (1mk)

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5. Aquatic animals are observed to survive in frozen ponds. Explain this observation. (2mks)

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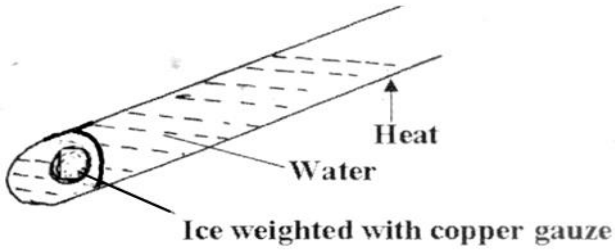
6. Ice was placed inside a test tube and water poured into it and then heated as shown below.



The ice remained intact as heating progressed. Explain this observation (1mk)

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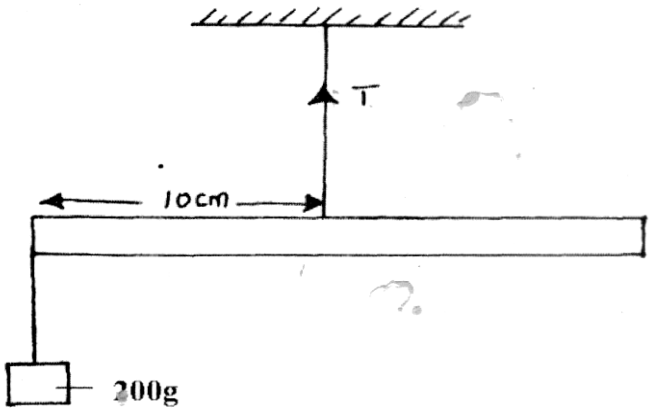
7. The figure below shows a metre rule balancing when a mass of 200g is hanged at one end as shown below.



Determine the tension T in the string (3mks)

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8. Suggest a reason why a person who has lost one leg is provided with crutches. (1mk)

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9. A pipe of diameter 12mm is connected to another pipe of diameter 18mm. If water flows in the wider pipe at the speed of $2ms^{-1}$, what is the speed in the narrow pipe? (3mks)

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10. Distinguish between uniform velocity and uniform acceleration (1mk)

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11. a) A bullet of mass 20g traveling with a velocity of 30m/s penetrates a sand bag and is brought to rest in 0.05secs. Find the average retarding force of the sand. (2mks)

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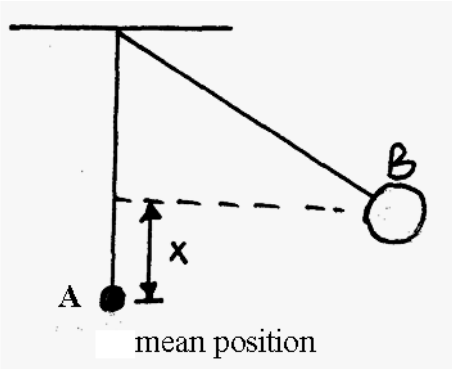
12. The diagram below shows a pendulum displaced by a distance X as shown below.



At what point will the potential energy be equal to kinetic energy? (1mk)

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13. 500g of a metal is heated to 100^0C and then placed in 200g of water at 15^0C. If the final temperature rises to 21^0C. Calculate the specific heat capacity of the metal (Specific heat capacity of water = 4200kg/j/k). (3mks)

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14. It is observed that when a bubble rises from the bottom of a glass filled with water to the top its size increases. Explain this observation. (1mk)

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SECTION B (55 MARKS)

Answer ALL questions in this section in the spaces provided.

15. a) State Hooke's law (1mk)

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b) i) A vertical spring of unstretched length 30cm is clamped at its upper end. When sand is placed in a pan attached to the lower end of the spring its length becomes 45cm. When 20g mass is placed on top of the sand the length increases to 55cm. Determine the mass of the sand. (3mks)

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ii) If the spring in (i) above is compressed from its original length to a length of 24cm, calculate the work done in compressing the spring. (2mks)

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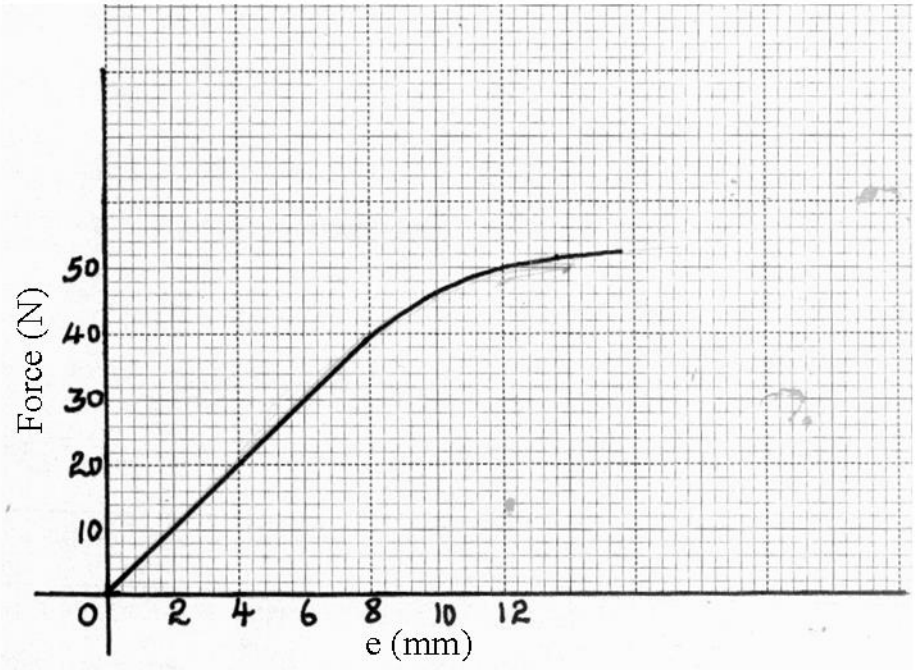
c) The figure below shows a graph force (F) against extension (E)



Determine the spring constant of the spring used (2mks)

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16. a) Define specific latent heat of fusion of a substance (1mk)

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b) 2 Kilograms of water losses 184 kilojoules of heat on cooling from 15^0C to ice at -10^0C. Determine the specific latent heat of fusion of water (specific heat capacity of water 4.2 x 10^3J/Kg K, specific heat capacity of ice is 2.1 x 10^2J/Kg K.) (4mks)

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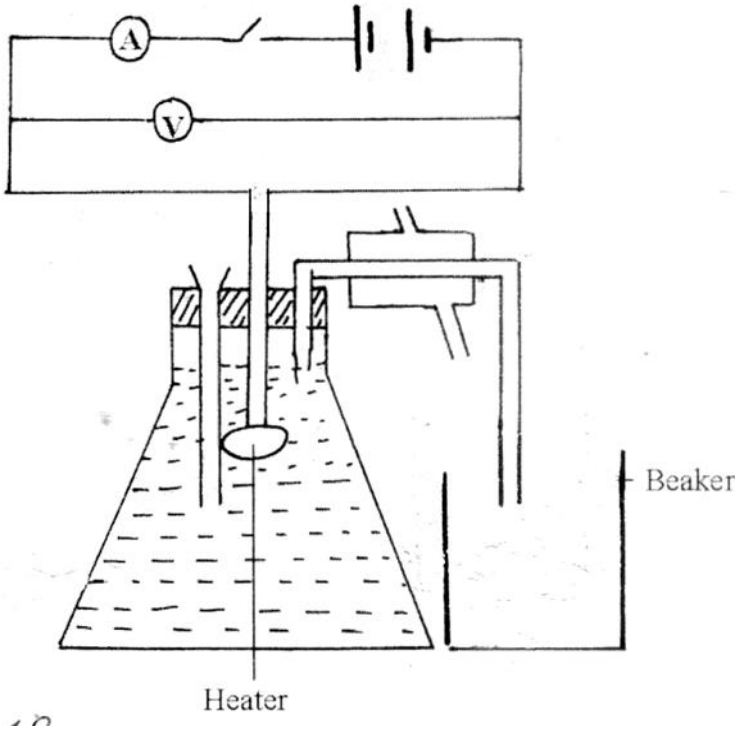
c) The diagram below shows a set up used to determine specific latent heat of vaporization of water electrically.



i) State **four** important measurements you will need to determine the specific latent heat of vaporization of water. (4mks)

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ii) Give an expression for specific latent heat of vaporization using the above measurements. (1mk)

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iii) Differentiate between evaporation and boiling. (1mk)

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17. a) Distinguish between elastic and inelastic collision (1mk)

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b) A ball X of mass 0.1Kg moving with a velocity of 6m/s collides directly with a ball Y of mass 0.2Kg at rest, X rebounced back with a velocity of 2m/s in the opposite direction after collision.

Determine:-

i) The velocity of Y after collision (3mks)

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ii) Kinetic energy after collision (2mks)

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c) On the axes provided, sketch a velocity-time graph for a body projected vertically upwards. (1mk)

d) A stone is projected vertically upwards with a velocity of 15m/s

Determine:-

i) Time it takes to come back to the point of projection (3mks)

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ii) Maximum height reached (2mks)

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18. a) State Archimedes' principle (1mk)

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b) Explain one application of Archimedes principle in real life situation (3mks)

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c) The mass of the fabric of a large ballon is 500Kg. The balloon is inflated with $2000m^3$ of helium. The balloon is attached to a cable fixed to the ground and released to still air (Density of air and helium are $1.3/cm^3$ and $0.18g/cm^3$ respectively)

i) Draw a diagram to show the forces acting on it (2mks)

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ii) Determine the tension in the cable (3mks)

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iii) What would be the acceleration of the balloon if the cable is cut? (3mks)

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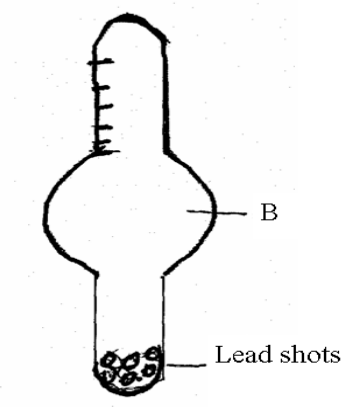
d) The diagram below shows a hydrometer



Why is the part marked B wider? (1mk)

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19. a) Define the term angular velocity (1mk)

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b) A wooden block of mass 200g is placed at a distance of 9cm from the centre of a turn table. When the turn table is rotated at constant angular velocity, the block begins to slide off the table. If the frictional force between the block and the turn table is 1.2N, determine:

i) The co-efficient of friction between the block and the turn table (2mks)

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ii) The linear speed of the block (3mks)

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iii) If the angular velocity is increased by 2π rad/s, What would be the force required to hold the block at the same place? (4mks)

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c) What is meant by the term "Banking" in roads? (1mk)

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