NAME:……ADM NO ……..CLASS……..……

INDEX No……DATE……SIGNATURE……..

232/1
PHYSICS
PAPER 1
JULY 2017
2 HOURS

MURUNG'A COUNTY MOCK END OF TERM II EXAMINATION
QUESTION PAPER

232/1
PHYSICS
PAPER 1

Instructions to candidates

i) Write your name, admission number and other particulars in the spaces provided ;
ii) Answer all questions in section A and B in the spaces provided after each question;
iii) All working for numerical questions must be clearly shown;
iv) Non programmable silent electronic calculators may be used
v) This paper consists of 8 printed pages, check and ascertain all pages are printed
vi) The paper is out of 80 marks;

Constants

You may use the following constants where necessary

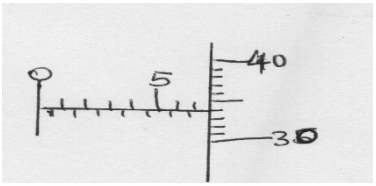
i) Earth's gravitational strength = $10Nkg^{-1}$;
ii) Density of water = $1,000kgm^{-3}$;
iii) Density of mercury = $13,600kgm^{-3}$
iv) Atmospheric pressure = 76cmHg
v) Speed of Sound is $330ms^{-1}$
vi) Refractive index of glass = $^{3}/_{2}$
vii) Refractive index of water = 4/3

For Examiner's Use Only

Section	Question	Maximum Score	Candidate's Score
A	1-11	25	
	12	9	
	13	14	
	14	11	
	15	13	
	16	8	
Total Score		80	

SECTION A (25MKS)

1. Figure I shows a reading of a micrometer screw gauge when a metallic spherical ball of mass 31.2g is measured in it.



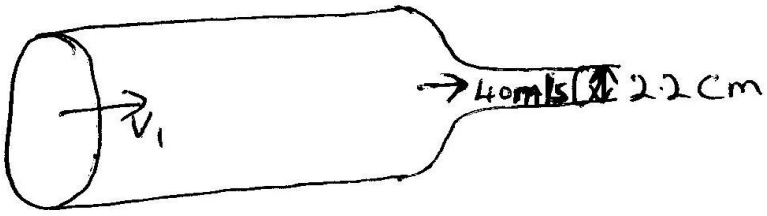
   If the micrometer screw gauge had a zero error of -0.01; what is

   a) The diameter of the sphere (2mks)

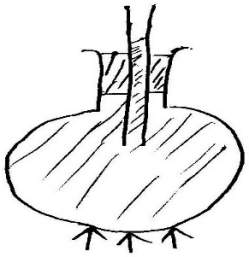
   b) The density of the ball (2mks)

2. Name one force that may determine the meniscus of liquid in a glass (1mk)

3. A water pipe of diameter 8.8cm is connected to another pipe of diameter 2.2cm .the speed of the water in the smaller pipe is 40m/s. What is the speed, V_1 of the water in the larger pipe?



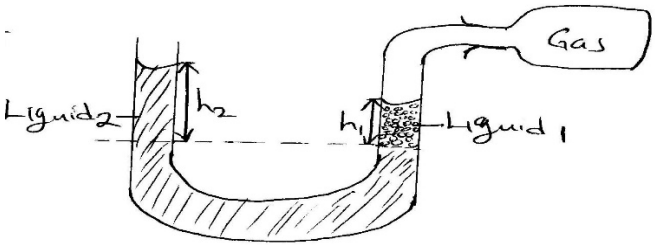
4. The figure below shows a volumetric flask fitted with a glass tube filled with coloured water which was heated to a temperature of 80^0c



   a) What was observed when the flame was withdrawn and left for some time? (1mk)

   b) Explain the observation made in 4(a) (1mk)

5. The figure below shows a u-tube connected to a gas supply containing liquids L_1 and L_2 of densities $1.8g/cm^3$ and $0.8g/cm^3$ respectively in equilibrium.



Given that h_1=8cm and h_2=12cm and the atmospheric pressure is $1.02x10^5$pa. Determine the gas pressure. (3mks)

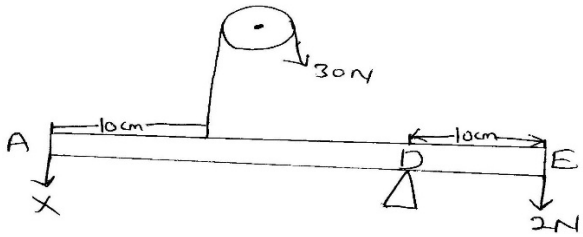
6. A cart of mass 35kg is pushed along a horizontal path by a horizontal force of 14N and moves with a constant velocity. The force is then increased to 21N .Determine:
   a) The resistance to the motion of the cart. (1mk)

   b) The acceleration of the cart. (2mks)

7. State the unit for spring constant. (1mk)

8. (a) How does the position of C.O.G affects the stability of a body? (1mk)

   (b)The figure below shows a uniform rod AE which is 40cm long .It has a mass of 2kg and pivoted at D. If 2Nis acting at a point E and 30N force is passed through a frictionless pulley, find the value of x acting at end A. (3mks)



9. A turntable of radius 16cm is rotating at 960 revolutions per minute .Determine the angular speed of the turntable. (2mks)

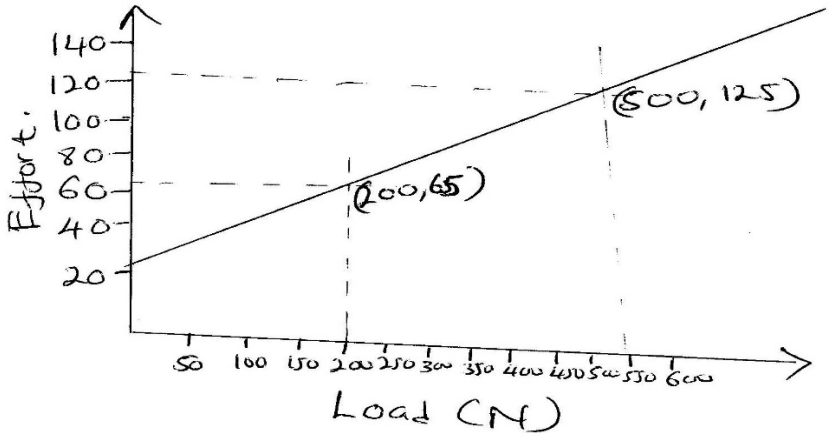
10. Distinguish between solid and liquid states of matter in terms of intermolecular forces. (1mk)

11. State two environmental hazards that may occur when oil spills over a large surface area of the sea. (2mks)

SECTION B: 55MKS

12. (a)Define mechanical advantage of a machine. (1mk)

(b)In an experiment to investigate the performance of a pulley system with a velocity ratio of 5 the following graph was plotted.



From the graph find

i. The effort when the load s 450N (1mk)

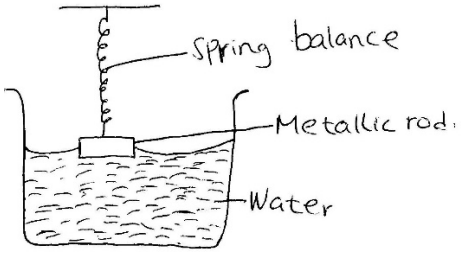
ii. M.A when the load is 450N (2mks)

iii. The efficiency corresponding to the load of 450N (2mks)

(C) Otieno uses the system in (b) above to exit a body of mass 50kg.It rises with a velocity of 0.15m/.Determine the power developed by Otieno. (3mks)

13. (a) State the law of floatation (1mk)

(b) The figure below shows metallic rod of length 10cm and uniform cross section area $4cm^2$ suspended from a spring balance with 7.5cm of its length immersed in water. The density of metallic rod is $1.5g/cm^3$ (Take density of water $=1.05g/cm^3$)



Determine

i. The mass of the rod (2mks)

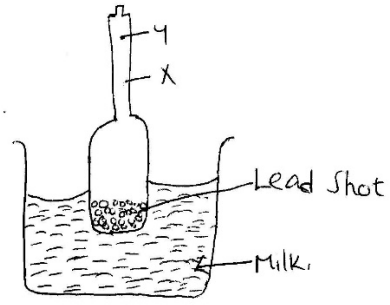
ii. The up thrust acting on the rod (2mks)

iii. The reading of the spring balance (2mks)

iv. The reading of the spring balance when the rod is wholly immersed in water (3mks)

(c)The figure below shows a special type of a hydrometer for testing relative density of milk.

The range of the readings of the hydrometer is 1.015 - 1.045



i. State the purpose of lead shot (1mk)

ii. How would the hydrometer be made more sensitive (1mk)

iii. Indicate appropriately on the diagram the given range of the readings of the hydrometer that correspond to the points marked X and Y. (1mk)

iv. The milk is then mixed with another liquid whose density is higher. State what is observed on the hydrometer. (1mk)

14. (a) What is meant by specific latent heat of vaporization of a substance? (1mk)

(b)In an experiment to determine the specific latent heat of vaporization of water steam at 100^0c was passed into water contained in a well lagged copper calorimeter .The following measurements were made.

- Mass of calorimeter=60g
- Mass of water and calorimeter=145g
- Final mass of calorimeter +water +condensed steam =156g
- Final temperature of the mixture = 48^0c

Take specific heat capacity f water =420Jkg^{-1}k^{-1}

Specific heat capacity of copper=390Jkg^{-1}k^{-1}

Determine the

i) Mass of condensed steam (1mk)

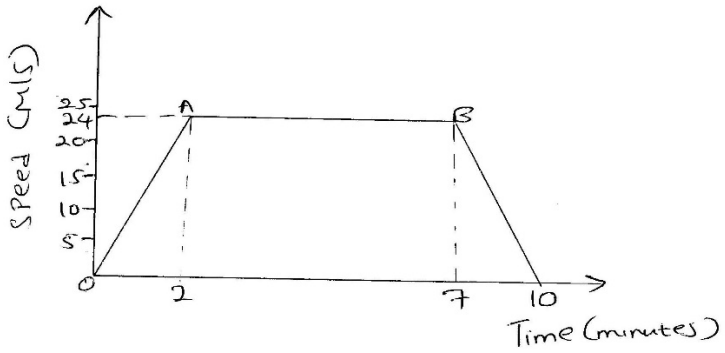
ii) The gained by the calorimeter and water if the initial temperature of the calorimeter and water is 20^0c. (3mks)

iii) Given that Lv is the specific latent heat of vaporization of steam, write a simplified expression for the heat given out by steam. (2mks)

iv) Determine the value of Lv above 2mks)

v) State the assumption made in the experiment above (1mk)

15. (a)The speed of a train hauled by a locomotive varies as shown below as it travels between two stations along a straight horizontal track.



Use the graph to determine

i) The maximum speed of the train (1mk)

ii) The acceleration of the train during the first 2min f the journey(2mks)

iii) Time during which the train is slowing down. (1mk)

iv) The total distance between the two stations (3mks)

v) The average speed of the train (2mks)

(b)A string of negligible mass has a bucket tied at the end. The string is 60cm long and the bucket has a mass of 45g. The bucket is swung horizontally making 6 revolutions per second.

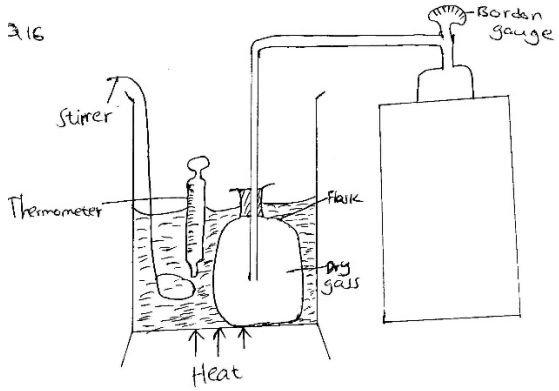
Calculate

i) The angular velocity (2mks)

ii) The angular acceleration (2mks)

iii) The tension on the string. (2mks)

16. (a)The diagram below shows asset up that a student used to investigate pressure law of a gas.



i) State the measurements that should be taken in the experiment (2mks)

ii) Explain how the measurement in (i) above may be used to verify the pressure law. (1mk)

(b)Name one limitation of the gas laws. (1mk)

(c)Oxygen gas of volume of 2500cm^3 at 10^{0}c and pressure of 3N/m^2 is compressed until its volume is 500cm^3 at a pressure of 6N/m^2 .Determine the new pressure of the gas after this compression in Kelvin. (2mks)