Name:……...……Index No……..……...

232/1
PHYSICS
THEORY
PAPER 1
JULY/AUGUST 2014
TIME: 2 HOURS

Candidate's Signature:……..……..……

Date:……..…….....

MIGORI SUB-COUNTY JOINT EVALUATION EXAM

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

232/1
PHYSICS
Paper 1
2 hours

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided.
- Mathematical tables and non-programmable calculators may be used.
- This paper consists of section A and section B.
- Attempt all the questions in the spaces provided.
- ALLOW working MUST be clearly shown.

For Examiners Use

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1 – 12	25	
B	13	11	
	14	12	
	15	10	
	16	10	
	17	18	
	TOTAL	**80**	

This paper consists of 9 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.

SECTION A (25 MARKS)

1. The figure below shows the reading ona burette after 65 drops of a liquid have been used.

If the initial reading was at zero mark determine the volume of one drop in m^3 (2mks)

2. State **two** factors that affect the spring constant of a spring made using a wire of a certain and a given thickness. (2mks)

……..……

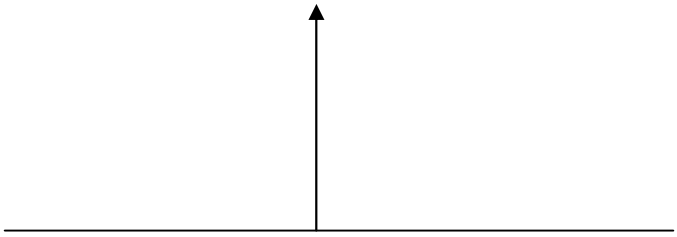
……..……

3. A cart of mass 60kg is pushed along a horizontal path by a horizontal force of 12N and moves with a constant velocity. The fore is then increase to 18N. determine

(a) The resistance to the motion of the cart. (1mk)

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

4. A mass of ice at – 20^{o}C is heated up to 10oC on the axis provided sketch the variation of volume up to 10^{o}C. (1mk)

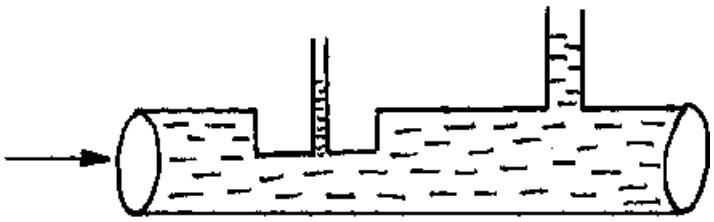


5. Water is pumped through a horse pipe at the rate of 120kg/minute and comes out from the nozzle with a velocity of 20m/s. Find the power of the pump. (2mks)

6. A sphere of mass 3kg moving with a velocity of 4m/s collides head on with a stationary of mass 1.5kg and imparts to it a velocity of 3.2m/s. Calculate the velocity of the 3kg sphere after collision. (3mks)

7. I an experiment the diameter d of an oil patch was measured to be 210mm for an oil drop of radius 0.21mm Determine the size of the oil molecule.(Take $\pi = 22/7$) (3mks)

8. The figure below shows a horizontal tube fitted with two other vertical pipes x and Y. water flows from left to right. Explain why the level of water in tube Y is lower than the level in tube x (2mks)



……..……

……..……

9. Us e Kinetic theory of gases to explain pressure law. (2mks)

……..……

……..……

10. Apin floats on water surface. Other than adding soap and taping the pin, state another method that can be used in the set up to make the pin sink. (1mk)

……

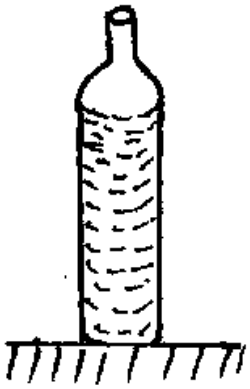
……

11. In vacuum flask, the walls enclosing the vacuum are silvered on the inside. State the reason. (1mk)

……

……

12. The figure below shows a soda bottle that is full. Explain how the stability of the bottle is affected as the soda is drunk three – quarter way. (2mks)



……

……

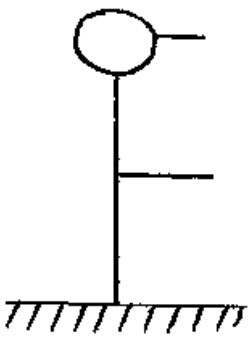
13. Explain why deflating the tyresof moto vehicle reduces extent of sinking of the wheel into a soft ground. (1mk)

……

……

SECTION B (55 MARKS)

14. (a) A hot air balloon is tethered to the ground on an windless day as shown in the figure below. The balloon contains 1600cm^{3}of hotair of density 0.7 kg/m^3. The mass of the balloon fabric is 400kg and the density of surrounding air is 1.3kg/m^3



Calculate

(i) The tension in the rope. (4mks)

(ii) Acceleration with which the balloon begins to rise when the rope is cut. (3mks)

(b) A rod of cross section area $3cm^2$ length 0.16m floats vertically upwards ina liquid of density 1.1 g/cm+ wit its length of 7cm above the surface. Determine

(i) Mass of the rod. (2mks)

(ii)The depth to which it will be submerged if put in an liquid of density $0.8g/cm^3$ (2mks)

15 (a) State the pressure law. (1mk)

……..……

……..……

(b) The pressure P of a fixed mass of gas at constant temperature (T = 300k) is varied continuously. The corresponding values of P and (V) of the gas are shown below.

Pressure ($x10^5$pa)	3	3.5	4	4.5	5	5.5
Volume (m^3)	0.025	0.020	0.017	0.014	0.012	0.011
$\frac{I}{v}$ (m^{-3})						

(i) Complete the table for the values of $\frac{I}{v}$ (2mks)

(ii) Plot a graph of P against $\frac{I}{V}$ (4mks)

(iii) Given that P = $\frac{3PT}{V}$ find R from the graph (3mks)

(c) A container closed with an airtight lid contains air at 1.2 x 10% Pa and temperature of 32^{o}C. The container is heated in water both until the lid opens. If the temperature at which the lid opens is 92^{o}C,Calculate the pressures attend by the gas. (2mks)

16. (a) Define Centripetal force. (1mk)

……..……

……..……

(d) An object of mass 0.5 kg is attached to one end of a light in extensible string and whirled up ina vertical circle of radius 1m and centre) as shown.

(i) If the tension on the string when the object is t the lowers point A is 13.0N. Calculate the velocity V of the object. (4mks)

(ii) Tension on the string when the object is at the highest point C of the circle. (3mks)

(iii) If the string was to break when the object is at the lowest point A of the path sketch the traced path by the object until it hits the ground. (3mks)

17 (a) A drinking glass of mass 0.4kg contains 400g of water at 20^{o}C. 0.02kg of ice 0^{o}C is dropped into

the glass determine.

(i) The quantity of heat lost by the glass and water . (3mks)

(ii) The quantity of heat gained by the ice and water. (2mks)

(iii) The final temperature of the mixture. (2mks)
(Take specific heat capacity of glass = 670J/kg/K, Latent heat of fusion of ice = 3.34 x 10^5J/kg specific heat capacity of water = 4.2 x 10^3 $JKg^{-1}K^{-1}$)

(b) (i) Distinguish between streamline flow and turbulent flow. (2mks)

……

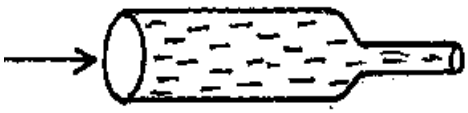
……

(ii) A boat travelling at a very high speed is likely to be dragged into a ship travelling in the opposite direction at high speed. Explain this observation. (1mk)

……

……

(iv) The figure below shows a non-viscous fluid that is not compressible moving through a tube of varied cross-sectional area



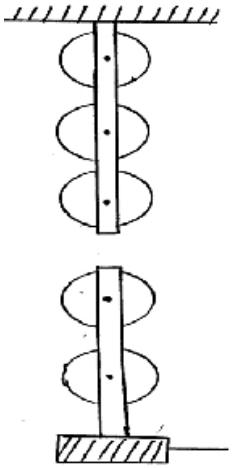
If the area of the narrower end is $0.05m^2$.calculate the diameter of the wider region.

18 (a) A bicycle has a driving cog wheel of radius 10cm and 24 teeth. The driven rear cog wheel has a radius of 40cm and 8 teeth . Determine

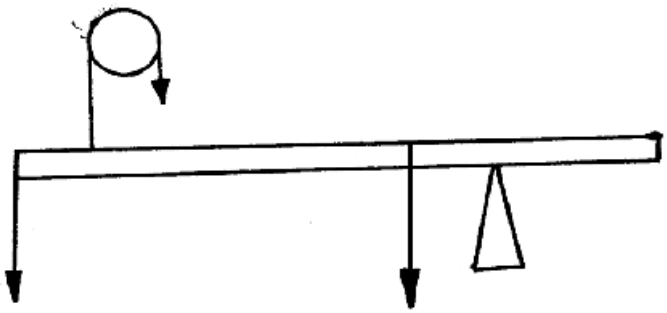
(i) The velocity ratio. (2mks)

(ii) the re efficiency (2mks)

(iii) Draw the string over the block and tackle pulley system below and indicate the direction of the effort (E) (2mks)



(b) (i) A wooden plank of negligible weight and 80cm long is supported by a knife edge at P. weights of 2N,4N, F and 8N act as shown.



(i) Calculate the value of F (3mks)

(ii) The moment of the weight of a vertical door does not significantly affect the moment of the force required to open the door. Give a reason for the this. (1mk)