PANGANI GIRLS SCHOOL
PRE – MOCKS 2013
Physics 232/1
Paper 1
Time: 2 hours

NAME…….INDEX NO……

CLASS……. CLASS NO……. DATE……..

Instructions to candidates

- Write your name and class in the space provided.
- This paper consists of two sections; **SECTION A** and **B**
- Answer **all** the questions in the spaces provided
- **ALL** working **MUST** be clearly shown.
- Mathematical tables and electronic calculators may be used
- Take: Acceleration due to gravity: **g = 10m/s^2**

FOR EXAMINER'S USE ONLY

Section	maximum score	Candidates score
A	25	
B	**55**	
Total score	**80**	

SECTION A – 25MARKS

1. A uniform rod has a weight of 60N. With a force of 30N at one end, it balances at a point 2m from the same end. Determine the length of the rod. (2mks)

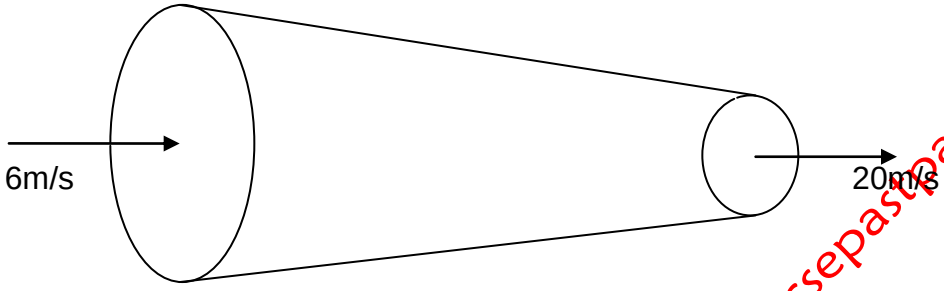
2. A spiral spring of a spring constant 50N/M produces an extension of 100mm when a certain force is applied to it. Find the magnitude of the force applied. (2mks)

3. Given that the diameter of an oil drop is 2.0mm and the diameter of the circular patch of the same drop on water is 20cm, calculate the thickness of the oil molecule. (3mks)

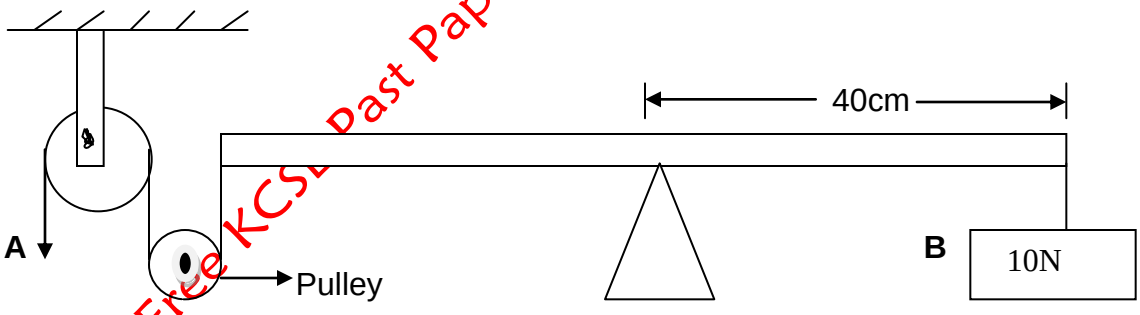
4. Two identical beakers A and B containing equal volumes equal volumes of water are placed on a bench. The water in A is cold while in B it is warm, identical pieces of potassium per manganate are placed gently at the bottom of each beaker inside the water. In which beaker will the potassium permanganate spread faster? Explain. (3mks)

5. State two consequences of surface Tension. (2mks)

6. In the figure below the liquid has streamlines motion. Calculate the diameter of the larger part of the pipe if the radius of the narrow part is 4cm.



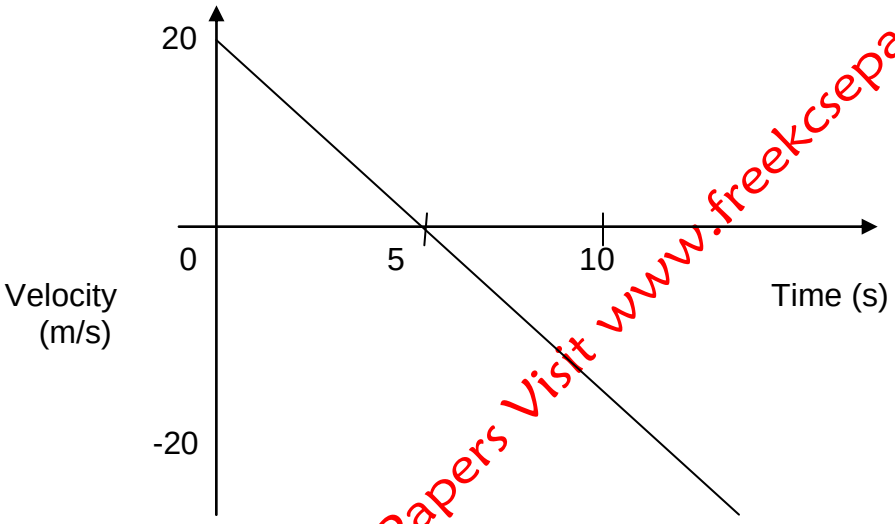
7. The diagram below shows a uniform meter rule balanced by two forces A and B, Force B is 10N and the weight of the rule is 6N. The lower pulley is movable and weight less but the upper is fixed and friction less. Calculate the force A. (3mks)



8. Thermal expansion has great importance in our daily life activity state any one use of thermal expansion in solids. (1mk)

9. Other than temperature difference state any other three factors that affect the rate of heat flow in a material. (3mks)

10. The figure below shows a velocity against time graph for a moving body.



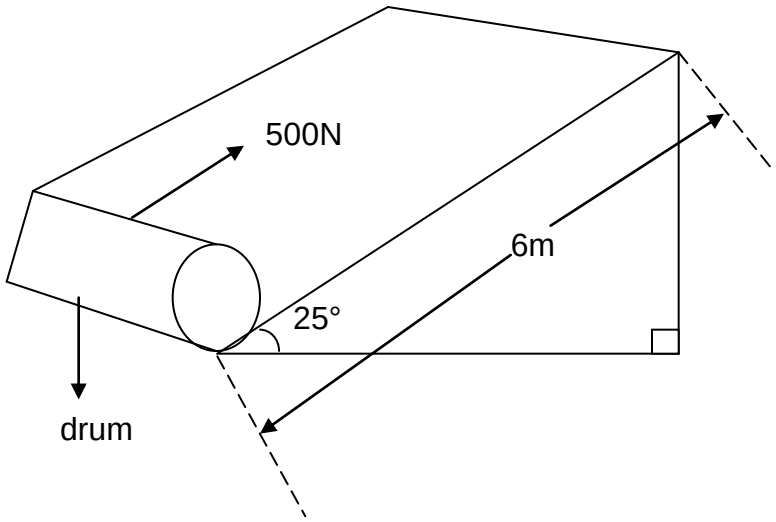
a. Describe the motion of the body during the 10 seconds. (2mks)

b. Determine the displacement of the body in 10 seconds. (1mk)

SECTION B – 55 MARKS

12.a. Define the term efficiency of a machine. (1mk)

b. A drum of mass 150kg is rolled up a plane inclined at 25° to the horizontal. The force F applied is 500N and the distance moved by the drum along the plane is 6m. Determine:



i. Work done by the effort. (2mks)

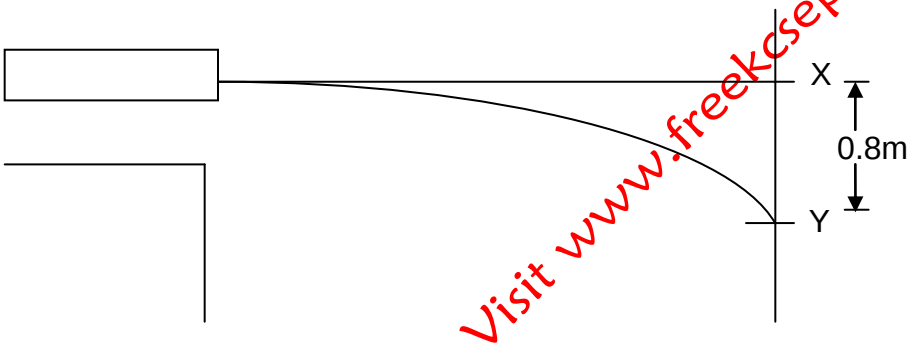
ii. Work done to raise the drum. (2mks)

iii. Efficiency of the inclined plane. (2mks)

c.i. Draw an inclined plane with a velocity ration 2. (2mks)

ii. If the inclined plane above is used to lift a mass of 0.6 tonnes to a truck when an effort of 1000N is applied. Determine the mechanical advantage of the system. (2mks)

13.a. A gun was aimed horizontally to hit the target at Y, 0.8m below X.



i. Explain why the Gun bullet hit Y and not at X? (1mk)

ii. Calculate the velocity with which the bullet left the gun. (3mks)

b. A stone is dropped from the top of a building and takes 2 seconds to reach the sand on the ground level. Calculate.

i. The velocity with which it strikes the ground. (2mks)

ii. The height of the building. (2mks)

iii. The average deceleration of the stone after the stone hit the sand if it penetrates the sand to the depth of 2.5cm. (2mks)

c. A body of mass 5kg is placed on the horizontal ground. Calculate the force required to pull the body with uniform velocity if the coefficient of friction is 0.5. (2mks)

14.a. In an experiment to determine the specific latent heat of vaporization of water, steam at 100°C was passed into water contained in a well lagged copper calorimeter. The following measurements were made.

Mass of calorimeter = 60g
Initial mass of water = 90g
Initial temperature of water = 10°C
Final mass of calorimeter + water + condensed steam = 153g
Final temperature of the mixture = 40°C

(specific heat capacity of water = 4200Jkg $^{-1}$ K $^{-1}$ and specific heat capacity of Copper = 400J kg $^{-1}$ k $^{-1}$)

a.i. Determine the mass of the condensed steam. (1mk)

ii. Determine the heat gained by the calorimeter and the water. (2mks)

b. Given that Lv is the specific latent heat of vapouration of steam.

i. Write an expression for the heat given out by steam. (1mk)

ii. Determine the value of Lv. (2mks)

c. Define the following terms.

i. Heat capacity (1mk)

ii. Latent heat of fusion. (1mk)

d. An immersion heater rating 1500W is placed in a metal block of mass 200g and specific heat capacity 900J kg -1 k -1. If the temperature of the metal changed from 20°C to 95°C.

i. Calculated the time taken to archieve this temperature change. (3mks)

ii. Name two sources of error in this experiment. (2mks)

15.a. State Charles law for an ideal gas. (1mk)

b. The set up shows an arrangement to determine the relationship between temperature and pressure of a gas at constant volume.

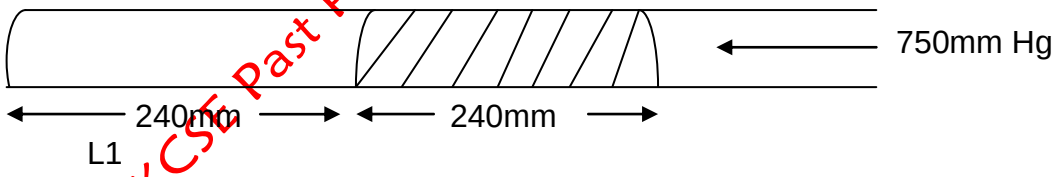
i. Describe how the measurements are obtained in the experiment. (3mks)

ii. Explain how the results from the experiment can be used to determine the

relationship between temperature and pressure. (2mks)

c. A bicycle tyre is pumped to a pressure of 3.2×10^5 paat 25°C. After a race the pressure is found to be 3.8×10^5pa.
Assuming the volume of the tyre did not change, what is the temperature of the Air in the tyre? (3mks)

d. Air is trapped inside a glass tube by a thread of mercury 240mm long. When the tube is held horizontally the length of the air column is 240mm.



Assuming that the atmospheric pressure is 750mmHg and the temperature is constant; Calculate the length of the air column when the tube is vertical with Open end down. (3mks)

16.a. Define pressure. (1mk)

b. Name two factors which affect pressure in liquids. (2mks)

c. The system shown below is used in Hydraulic brakes.

i. If a force of 1000N is applied to the cylinder calculate the pressure transmitted to the wheels. (2mks)

ii. If the slave/wheel cylinder have an area $0.5m^2$. Calculate the force exerted on the wheels.
(2mks)