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Gampaha Education Zone

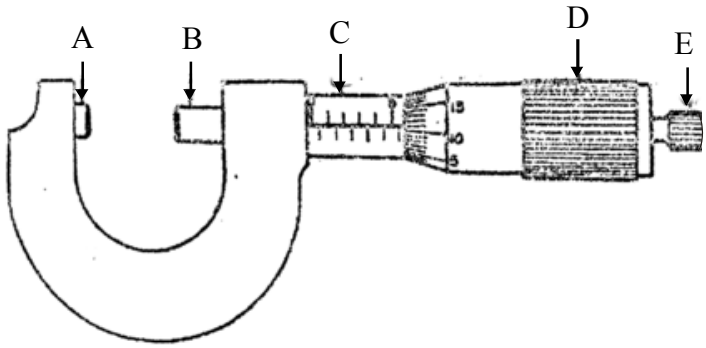
දෙවන වාර ඇගයීම - 2025
Second Term Evaluation - 2025

ශ්‍රේණිය **Grade**	12	විෂයය **Subject**	Physics II	කාලය **Time**	පැය 3 යි 3 hour

Name :- .....

Part A - Structured Essay

01. Micrometer screw guage is better to measure the diameter of a thin wire in laboratory.



(i) Name the parts of the diagram denoted by letters.

A - ..... D - .....

B - ..... E - .....

C - .....

(ii) What is the least count if "B" moves 5 mm when "D" is rotated 10 rounds ? The circular scale is divided in to 50 divisions.

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(iii) What is the methodology you follow to increase the accuracy of the measurement when measuring the diameter of a wire ?

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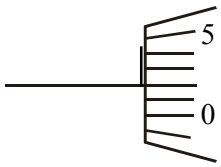
This is the way scales are seen, when A and B are in contact.



(iv) what is the error shown here ?

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(v) What is the method you follow to take a measurement of an object, keeping between A and B without applying excess pressure on it ?

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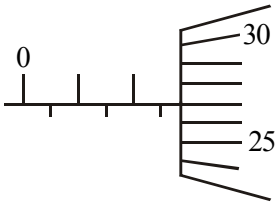
Following is the way scales are seen when measuring the diameter of the wire.



(vi) What is the reading ?

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(vii) What is the correct measurement ?

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(viii) calculate the percentage error of the above measurement

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The corrected measurements obtained for the diameter of a wire, is given below.

d_1/mm	d_2/mm	d_3/mm	d_4/mm	d_5/mm	d_6/mm
2.01	2.02	2.01	2.03	2.02	2.03

(ix) What is the most accurate value for the diameter ?

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(x) Find the density of the material of the wire is made of, if the length and the mass of the wire are 4 cm and 400 mg respectively. (Take $\pi = 3$)

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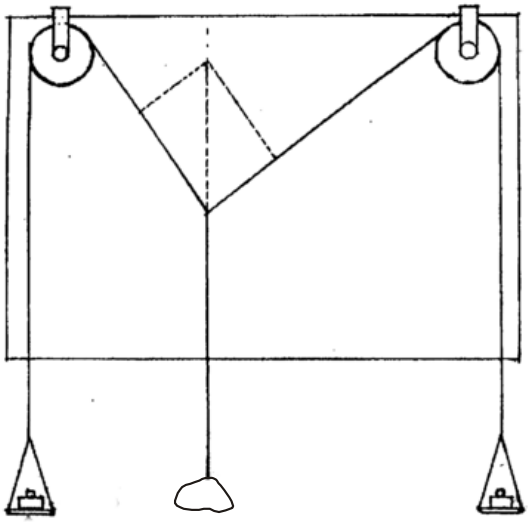
02. An experiment to determine the mass of an object with unknown mass by parallelogram law of following items and instruments for that.
pins, A - 4 white papers, light strings, light balance pans, number of loads. set square, a ruler, a pair of compasses.



(i) Write down the parallelgran law of forces.

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(ii) What is the reason to use light strings in this experinent ?

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(iii) How do you check whether pulleys are fricition less ?

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(iv) State the experimental steps that are needed to obtain the projection of strings on the paper, after the system is in equilibrium by keeping the loads on the balance pans.

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(v) What is the reason for not drawing the parallelogram by using the shadow of the string in here.

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(vi) What are the reasons for the diagonal of the parallelogram is not vertical after it is complefed

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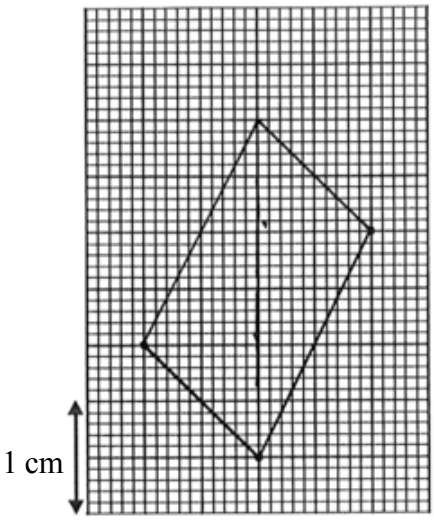
The parallelogram obtained when an unknown mass is placed on the middle balance pan is given below. (1 cm = 80 g)



(vii) What is the value of the unknown mass.

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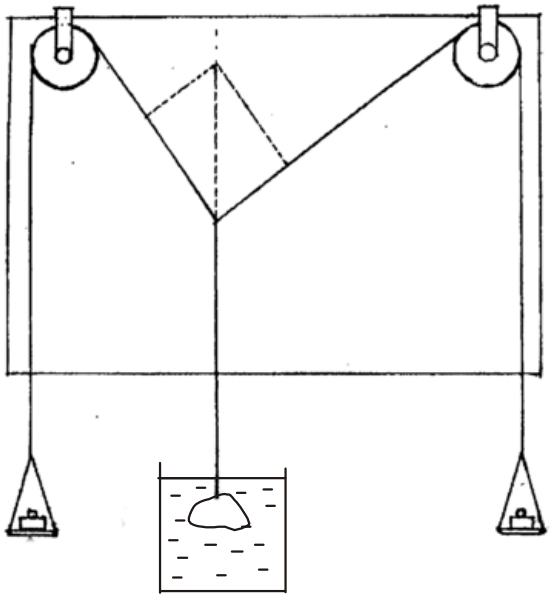
A student plan to determine the relative density of the above object using this experiment.

He removes the middle balance pan and the object is connect to the string.

The object is totally immersed in the water and completed a prallelogram in the same way and same scale. The length of the diagonal of this parallelgram is 2 cm.



(viii) Mark all the forces acting on the object when it is in equilibrium (Tension of string T, weight of the mass is W, up thrust force - U)

(ix) Write down the expression for the equilibrium of the mass in terms of T, U and W.

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(x) Find the relative density of the object.

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03. To find an unknown mass (m) of a irregular shaped object, a student is provided with following instruments and materials.

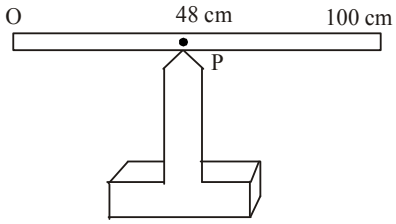
★ A meter ruler

★ A knife edge mounted on a wooden support.

★ sufficient amount of strings

★ set of weights.

(i) A meter ruler is balanced on the knife edge. Mark all the forces acting on it.



(ii) What is the nature of the meter ruler ? (uniform or not)

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(iii) Find the reason for balancing the meter ruler at ' P ' always, when measurenents are taken.

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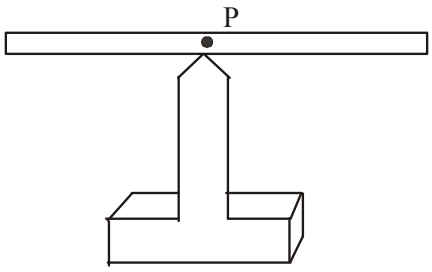
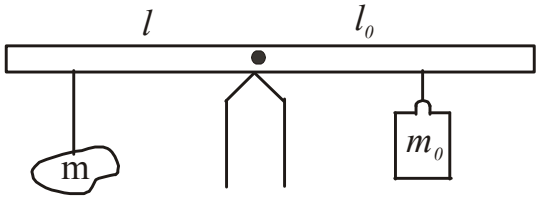
(iv) If you are provided with one string and not enough to hang both masses on it how they are placed on the ruler.



(v) Obtain a relationship among m, m_0, l and l_0. for the equilibriun of meter ruler.



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(vi) Rearrange equation to plot a graph to find m, considering l is changed in known values and l_o is measured.

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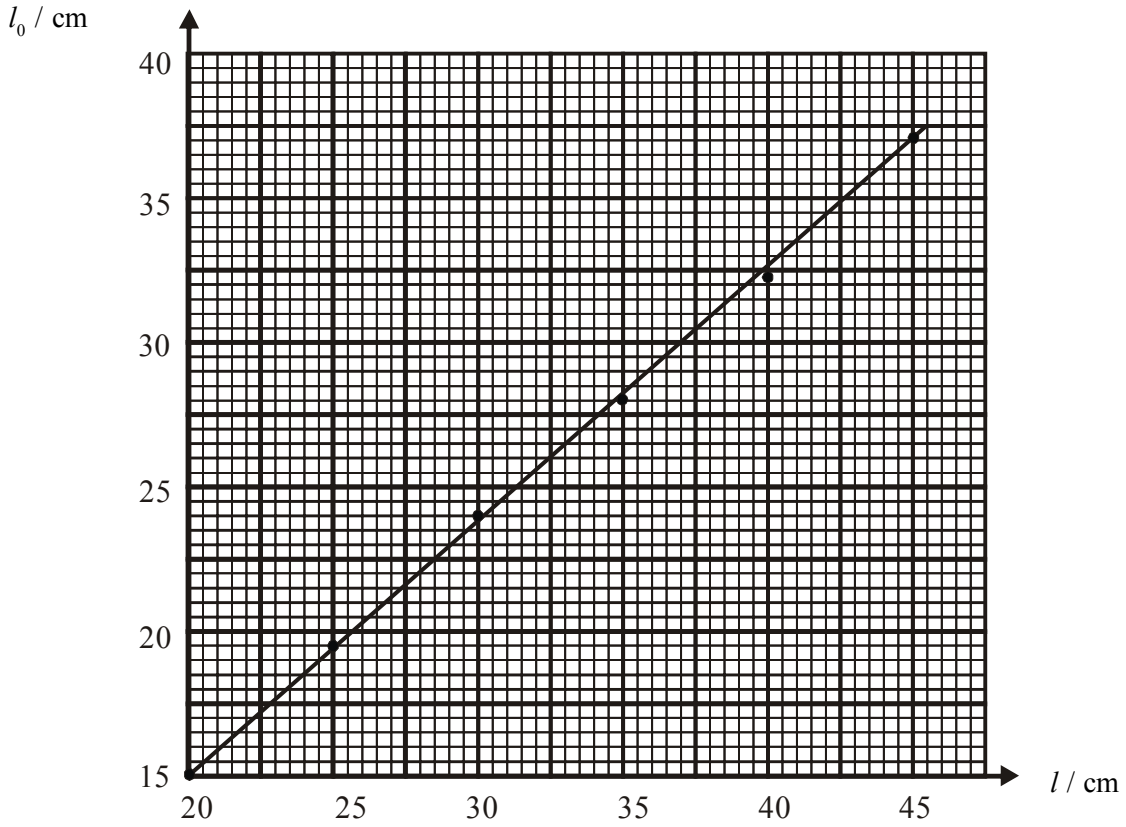
(vii) According to the re-arrangement,

(a) independent variable .....

(b) dependent variable .....

Following graph is obtained according to the readings taken by a student.



(viii) Select two points on the graph to find the gradient.

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(ix) Find the gradient using the coordinates of selected points.

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(x) Find the value of unknown mass if the known mass is 50 g.

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(xi) How do you check the accuracy of the obtained value for the unknown mass.

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04. (a) 1 kg mass resting on smooth horizontal table is connected to a spring balance and pulled forward keeping the balance horizontal as follows.

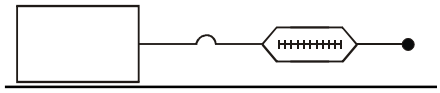

figure (i)

(i) Find the acceleration of the block, When the reading of the spring balance is 2N.

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(ii) When the balance is slanted 30^0 horizontally, and the reading is 5N find the acceleration.

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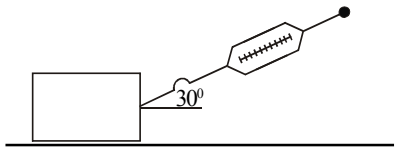

figure (ii)

(iii) Find the work to be done to move the block 2m along the surface as in (ii)

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(iv) If the surface is rough, and the spring balance is kept as figure (i) and pulled, the spring balance reading is 5N, the block is at static limiting equilibrium. Find the coefficient of limiting friction.

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(v) consider the above object moving at a constant velocity. The spring balance reading is 4.5 N. Find the coefficient of dynamic friction in between the mass and the surface.

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(vi) Find the spring balance reading when the wooden block is kept on the rough surface as in figure (ii) and kept at static quillibriun.

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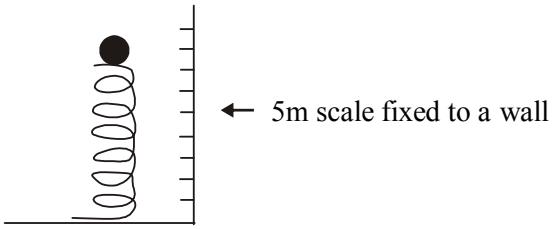
(b) A simple experiment to find the spring constant of a small spiral spring is given below.



A ball 20 g kept on the spring is pressed down and released and moves up freely (The height of the spring is not significant compared to the height the ball rises up above)

(i) Find the gravitational potential energy. when the object rises up to 4 m after pressed down

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(ii) Find the maximum speed the object acquires ?

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(iii) Find the value of the spring constant, if the extension is l0 cm.

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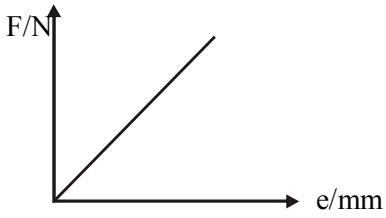
Following is the graph of force vs. extension graph.



(iv) Draw the graph for a spring of higher spring constant on the same axes.