



Holiday Assignments

Section Name: A/L

Subject: Physics

Grade : 12 E Sci

Medium: English

Physics

II

Md
Md

Model Paper 1

Md Shafiq
Md Shafiq

1 1/2 hours

Mohamed Shafiq

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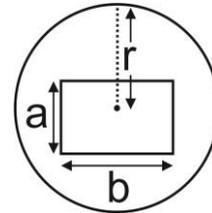
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PART B – Essay

Answer All questions.

($g = 10 \text{ N kg}^{-1}$)

01. A circular metal sheet of radius r with a rectangular hole of lengths a and b . The thickness of sheet is t ($< 1 \text{ cm}$)



- (i) What is the most suitable measuring equipment to measure the thickness t of sheet?

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- (ii) What is the important experiment step to be practiced before the use of above equipment?

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- (iii) What is the minimum measurement that can be measured accurately from above instrument?

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- (iv) The above measurement were taken by using a vernier caliper. Which parts of the measuring equipment are used to obtain the each measurement?

a :

b :

r :

- (v) What is the most suitable laboratory equipment to measure the mass (m) of the metal sheet?

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- (vi) Write an expression for volume of metal sheet using above symbols?

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(vii) Write an expression for density of metal?

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(viii) The measurement obtained at several places for the thickness of the metal sheet are given below.
3.52 mm, 3.51 mm, 3.52 mm, 3.51 mm, 3.53 mm

a) What is the least count of the equipment?

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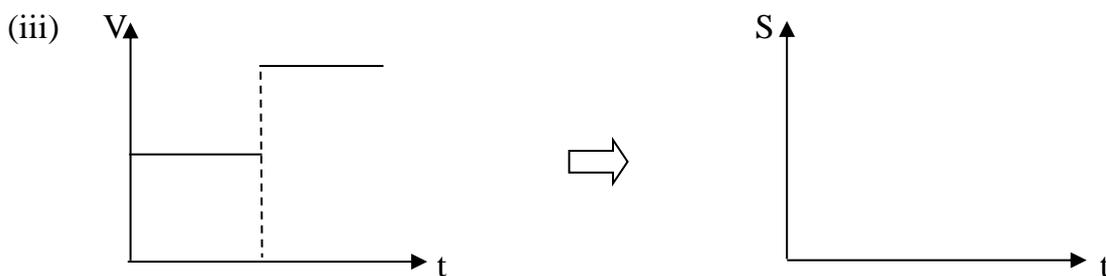
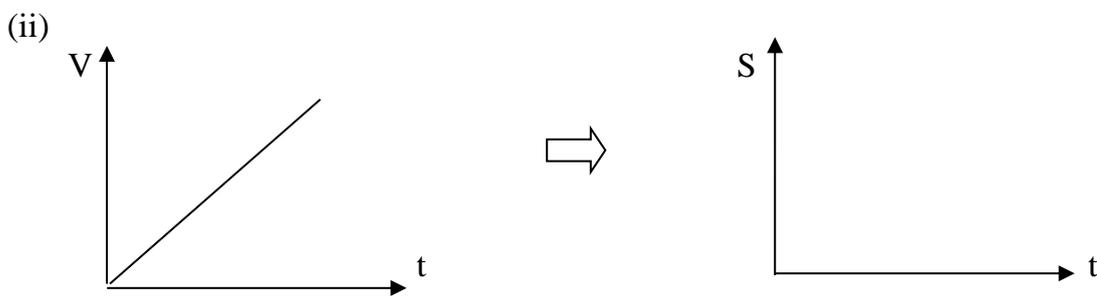
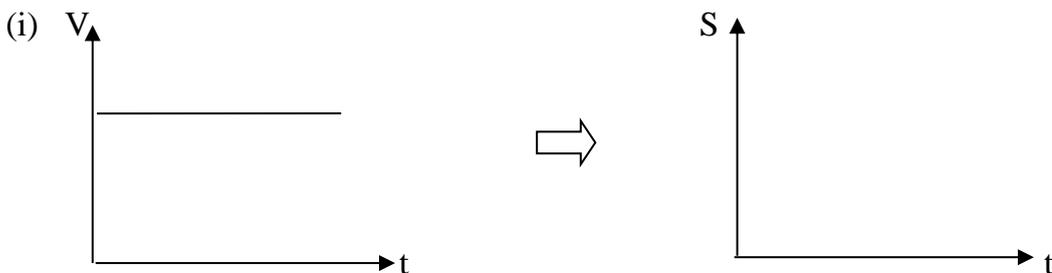
b) Calculate the mean thickness of the sheet.

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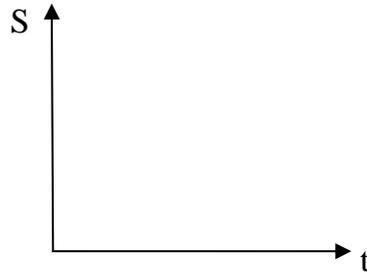
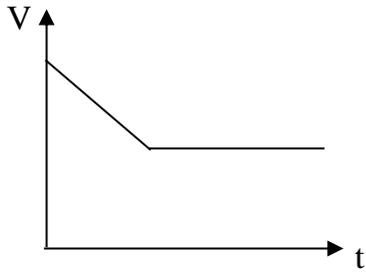
c) How many decimal places can be included in your answer. Explain your reason?

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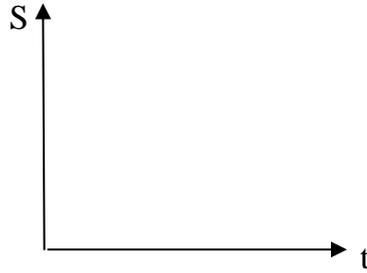
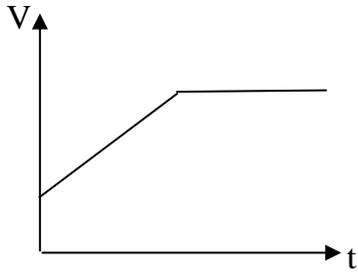
02. a) Draw displacement (s) - time (t) for following velocity (v) - time (t) graph



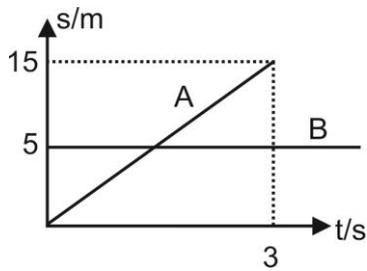
(iv)



(v)



b)



Displacement (s) – time (t) graphs of the object A and B as shown figure

(i) What is the velocity of the object A?

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(ii) What is the time taken when they meet together?

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(iii) What is the distance between A and B at t = 3s?

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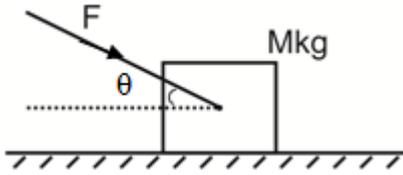
(iv) What is the velocity of A relative to B?

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(v) What is the distance travelled by A in 3rd s?

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03.



An object of M kg is placed at rest on surface of coefficient of dynamic friction μ and an external force F applied on the object at an angle θ to the horizontal.

a) If $\theta = 0^\circ$, $F = 10\text{N}$, $M = 10\text{ kg}$ & $\mu = 0$, find the distance travelled by the object in 10s

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b) If $\theta = 0^\circ$, $F = 50\text{N}$, $M = 10\text{kg}$, $\mu = 0.6$, find frictional force at on the object and velocity in 5s.

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c) If $\theta = 0^\circ$, $F = 80\text{N}$, $M = 5\text{kg}$, $\mu = 0.8$, find acceleration of the object and energy lost due to friction in 5s.

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d) If $\theta = 45^\circ$, $F = 50\sqrt{2}\text{ N}$, $M = 5\text{kg}$, $\mu = 0.6$, Find

i) acceleration

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ii) velocity and energy lost due to friction in 2s.

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Essay
Answer all the questions.

01. Every day, the sun radiates an enormous amount of energy called solar energy. It radiates more Energy in one day than world uses in one year. This energy comes from within the sun itself. Like most stars, the sun made up mostly of hydrogen and helium gas. The sun makes energy in its inner core in a process called nuclear fusion. The energy released from the surface of sun per second 4.5×10^{26} w. This energy takes 8 minutes to reach the earth surface with the speed of light 3×10^8 ms⁻¹. The rate of solar energy falls on the surface in a unit area is known as solar intensity or solar constant. The average solar constant on the earth surface is 1000 Wm^{-2} .

Today, people use solar energy to heat the buildings and water and to generate electricity. Solar electricity can be produced using two way such as solar cells and solar thermal system. Solar panel refers to a panel designed to absorb the sun ray as a source of energy for generating electricity. Solar panels can convert sun light to electricity with 10% efficiency. In Sri Lanka, the average power generate period of solar panels is 5 hours per day.

A project is planned by Old Boys Association (OBA) of a school to use the solar panels to generate the energy requirement of five selected classes in A/L Science stream. Each class consist of two 50W bulbs and one ceiling fan of 80W for 6 hours daily.

- (i) What are gasses that inside the sun?
- (ii) What is the name of process that sun emits the solar energy to environment?
- (iii) What are the uses of solar energy used by nowadays?
- (iv) What are the methods that can produce solar electricity?
- (v) Calculate the mass lost by sun in one year.
- (vi) Calculate the average distance from surface of sun to surface of the earth.
- (vii) Calculate the average power received by Sri Lanka from the sun. Assume area of the Sri Lanka is $60,000 \text{ km}^2$.
- (viii) Calculate the daily energy requirement for five classes in the school.
- (ix) Calculate the total area of the solar panel needs to fulfill energy requirement of classes. Assume capable of delivering energy to instrument with 90% efficiency.

02.

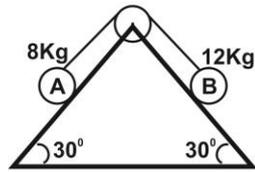


Figure 01

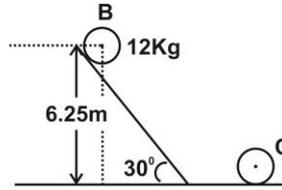


Figure 02

The masses of A & B are 8 kg and 12 kg respectively. They connected two ends of light string passing over smooth pulley and placed on smooth inclined plane as shown figure. If the system released at rest.

- i) Draw the force diagram of A and B
- ii) Calculate the tension of the string and acceleration of the objects.
- iii) After 10S, string will break, the position of B as shown figure II.
 - a) Total distance travelled by A, before it comes to rest.
 - b) What is the velocity of B when it reaches the ground/horizontal level?
 - c) If the object B impact with the object C perfect elastically, the speed of B after impact is 10 ms^{-1} to same direction, find mass and speed of the object C.