NAMA : _____ KELAS: _____

960/1

OKTOBER 2013

PEPERIKSAAN PENGGAL 1

SIJIL TINGGI PELAJARAN MALAYSIA 2014

NAMA SEKOLAH

PHYSICS

PAPER 1

One hour and thirty minutes

Instructions to candidates:

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

There are **fifteen** *questions in Section A.. For each question, four suggested answers are given. Choose* **one** *correct answer and indicate it on the multiple-choice answer sheet BELOW.*

There are **two** *questions in Section B. Answer* **BOTH** *questions.*

There are **three** *questions in Section C. Answer* **two** *questions* **only**.

MULTIPLE-CHOICE ANSWER SHEET

1. =A= =B= =C= =D=
2. =A= =B= =C= =D=
3. =A= =B= =C= =D=
4. =A= =B= =C= =D=
5. =A= =B= =C= =D=
6. =A= =B= =C= =D=
7. =A= =B= =C= =D=
8. =A= =B= =C= =D=
9. =A= =B= =C= =D=
10. =A= =B= =C= =D=
11. =A= =B= =C= =D=
12. =A= =B= =C= =D=
13. =A= =B= =C= =D=
14. =A= =B= =C= =D=
15. =A= =B= =C= =D=

MULTIPLE -CHOICE	
16	
17	
18	
19	
20	
TOTAL	

Section A [15 *marks*]

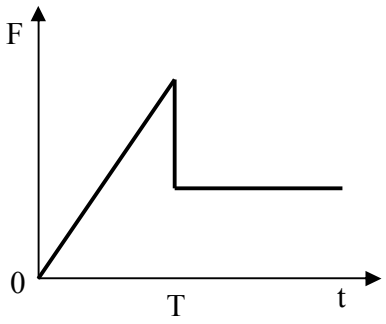
1. Which of the following constants have dimensions that do not include the dimension of length?

$F = \frac{GmM}{r^2}$, $E = \frac{hc}{\lambda}$, $F = Ce$, $E = \frac{1}{2}kT$

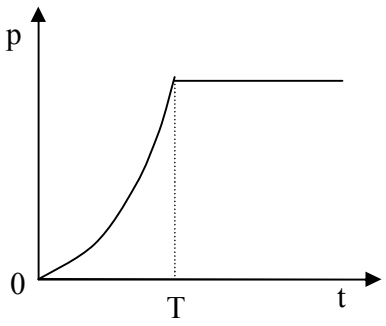
where the symbols F represents force, m and M are masses and r represents the distance between them, c is the speed of light and λ is its wavelength, e is the extension of the spring, E is energy and T represents absolute temperature.

A. gravitational constant,G
B Planck's constant,h
C spring constant,C
D Boltzman's constant,k

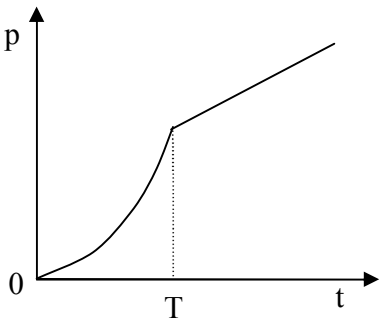
2. A body initially at rest was acted on by a force in the same direction. The magnitude of the force F changes with time t as shown in the diagram below.



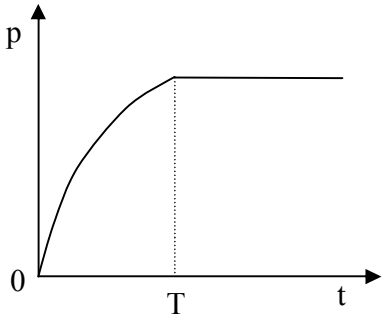
Which of the following graphs shows changes in the linear momentum p of the object with time t ?



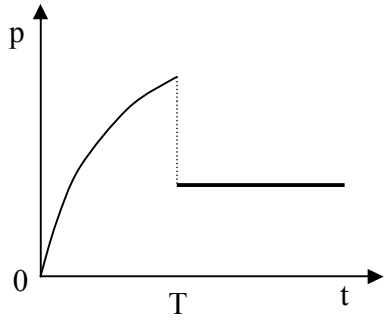
A



B



C

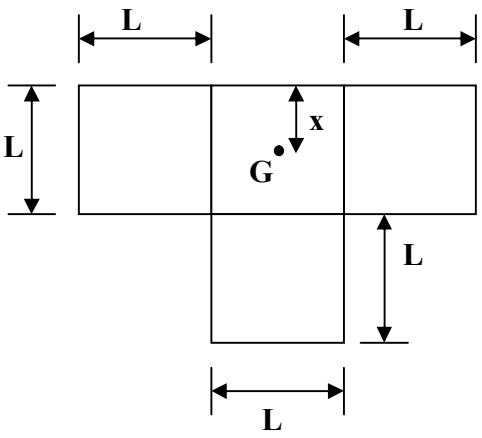


D

3. A bullet of mass m moving with velocity u penetrates a piece of stationary plasticine of mass M . The bullet emerges from the piece of plasticine with velocity v in the same direction as the initial direction of the bullet, and the plasticine attached to the bullet has the same mass as that of the bullet. The velocity of the remaining plasticine immediately after the bullet emerges from it can be expressed as

A $\frac{m(u-2v)}{(M-m)}$ **B** $\frac{m(u-2v)}{M}$ **C** $\frac{m(u-v)}{(M-m)}$ **D** $\frac{m(u-v)}{M}$

4.



The point G is the centre of mass of a T-shaped lamina of uniform thickness with dimensions as shown above. The lamina is made up of 4 similar squares. What is the distance x ?

A $\frac{L}{3}$ **B** $\frac{L}{2}$ **C** $\frac{2L}{3}$ **D** $\frac{3L}{4}$

Section B [15 *marks*]

16. (i) What do the terms *systematic error* and *random error* mean? [2 *marks*]

(b) The length of a piece of paper is measured as 297 ± 1 mm. Its width is measured as 209 ± 1 mm.

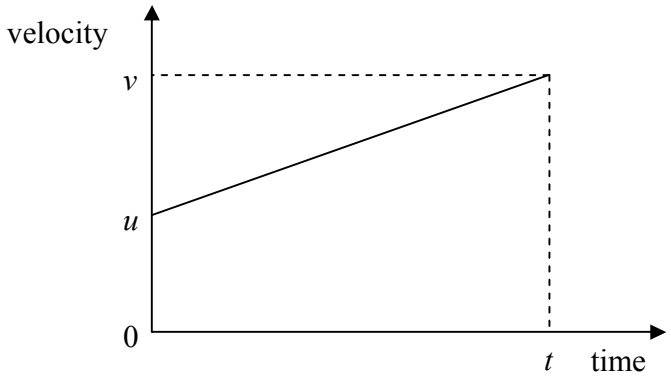
(i) What is the fractional uncertainty in its length ? [1 *mark*]

(ii) What is the percentage uncertainty in its length ? [1 *mark*]

(iii) What is the area of one side of the piece of paper? Use error analysis and state your answer with its uncertainty. [3 *marks*]

Section C [30 *marks*]

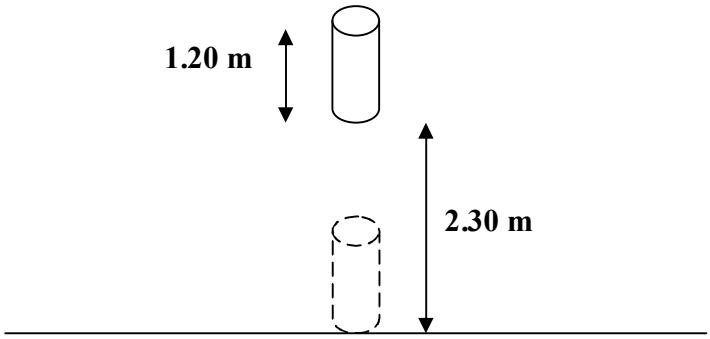
18. (a) An object accelerates uniformly in a straight line from velocity u to v in time t, as shown in the diagram below.



(i) Write down an expression for the acceleration, a in terms of u, v and t. [1 *marks*]

(ii) **From the figure above**, and your answer in (i), show that the distance traveled, s is given by $s = \dfrac{v^2 - u^2}{2a}$ [2 *marks*]

(b) A cylinder of length 1.20 m , cross sectional area of 8.30×10^{-5} m^2, and mass 0.777 kg falls from rest so that its base drops from a height of 2.30 m above the ground as shown in the figure below.



(i) Ignoring air resistance, calculate the kinetic energy of the cylinder just before it hits the ground. [2 *marks*]

Skema Pemarkahan Peperiksaan Penggal 1 STPM 2014

Section A

1	**C**	**6**	**D**	**11**	**C**
2	**B**	**7**	**D**	**12**	**C**
3	**A**	**8**	**D**	**13**	**B**
4	**D**	**9**	**B**	**14**	**C**
5	**A**	**10**	**D**	**15**	**B**

Section B

16. (i) Systematic errors are constant errors which cause all results to be incorrect by roughly the same amount in the same direction (either too high or too low a value).
……1

Random errors are minor experimental or accidental errors due to errors of judgement or mildly fluctuating conditions which cannot be controlled. ……1

(b) The length of a piece of paper is measured as 297 ± 1 mm. Its width is measured as 209 ± 1 mm.

(i) Fractional uncertainty in length = $\frac{\Delta L}{L} = \frac{1}{297}$ ……1

(ii) Percentage uncertainty in length = $\frac{1}{297} \times 100 = 0.337\%$ ……1

(iii) Area , A = 297 x 209 = 62073 mm^2

Area , A = Length L x Width w

$$\frac{\Delta A}{A} = \frac{\Delta L}{L} + \frac{\Delta w}{w}$$ ……1

$$\Delta A = A \times \left(\frac{\Delta L}{L} + \frac{\Delta w}{w} \right)$$

$$= 62073 \times \left(\frac{1}{297} + \frac{1}{209} \right)$$

$$= 506 \text{ mm}^2$$

$$= 500 \text{ mm}^2 \quad (1 \text{ sig fig})$$ …….1

Required area A = 62100 ± 500 mm^2 OR $(62.1 \pm 0.5) \times 10^3$ mm^2……..1

17. (a) (i) The specific heat capacity of a material is the amount of heat required to raise the temperature of 1 kg(unit) of that material by 1 K(or ^{o}C) …….1

OR Specific heat capacity, $c = \frac{Q}{m\theta}$ where Q is the amount of heat required, m is the mass of the material and θ is the rise(change) in temperature.

(ii) $Q = mc\theta$

$\frac{dQ}{dt} = mc\frac{d\theta}{dt}$ …….1

The rate of rise of temperature $= \frac{d\theta}{dt}$

$= \frac{P}{mc}$ ……..1

(b)(i)

Power = $\frac{Work}{Time}$ ……1

Work = Power x Time

= 300 x 150 = 4.5 x 10^4 J …….1

(ii)

$P = mc\frac{d\theta}{dt}$ …….1

0.7 x 300 =0.45 x 390 x $\frac{d\theta}{dt}$ 0.7 x 300 ……..1

Initial rate of rise in temperature $\frac{d\theta}{dt}$ = 1.2 Ks^{-1} ……..1

Suka sampel ini?

Kertas Percubaan STPM

Sem 1 · Fizik

- Semester 1: kertas percubaan (trial) negeri, subjek yang dipilih + skema
- Blueprint 30 hari Semester 1 (setiap subjek)
- Semester 3: percubaan 2024, 10 subjek, banyak negeri, soalan + skema dalam satu fail

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