Name **I/C**

:…… **:……**

PENGGAL 1

960/1 **STPM 2019**

JABATAN PENDIDIKAN NEGERI KELANTAN
SIJIL TINGGI PERSEKOLAHAN MALAYSIA

PHYSICS 1 (FIZIK 1)
MODUL 1

One and a half hours (Satu jam setengah)

Instructions to candidates:

DO NOT OPEN THIS QUESTIONS PAPER UNTIL YOU ARE TOLD TO DO SO.

There are **fifteen** *questions in Section A. For each questions, four choices of answers are given. Choose* **one** *correct answer and indicate it on the Multiple-choice Answer Sheet provided. Read the instructions on the Multiple-choice Answer Sheet very carefully. Answer* **all** *questions. Marks will not be deducted for wrong answers.*

Answer **all** *questions in Section B. Write your answers in the spaces provided.*

Answer any **two** *questions in Section C. All essential working should be shown. For numerical answers, unit should be quoted wherever appropriate. Begin each answer on a fresh sheet of paper and arrange your answers in numerical order.*

Tear off the front page of this question paper in your answer sheets of Section B, and tie both of them together with your answer sheets in Section C.

Values of constant are provided.

Answers may be written in either English or Bahasa Malaysia

For examiner's use (Untuk kegunaan pemeriksa)	
Section A (Bahagian A)	
Section B (Bahagian B)	
16	
17	
Section C (Bahagian C)	
Total(Jumlah)	

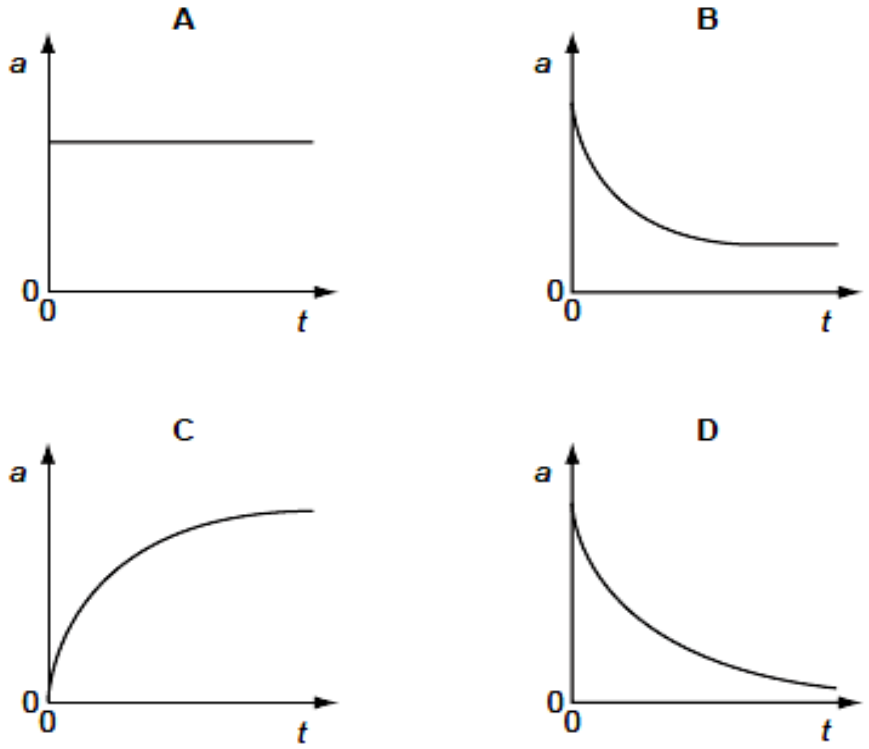
This question paper consists of 12 printed pages and 0 blank pages.
(Kertas soalan ini terdiri daripada 12 halaman bercetak dan 0 halaman kosong.)

Section A [15 *marks*]
Answer **all** *questions in this section*.

1 Which group of quantities contains only vectors?

A acceleration, displacement, speed
B acceleration, work, electric field strength
C displacement, force, velocity
D power, electric field strength, force

2. A tennis ball is released from rest at the top of a tall building.
Which graph best represents the variation with time t of the acceleration a of the ball as it falls, assuming that the effect of air resistance is not negligible?



3. A gun fires 150 bullets per minutes at a speed of 250 m s^{-1} relative to the gun. If the mass of each bullet is 10.0 g, what is the recoil force acting on the gun?

A 3.75 x 10^{2} N
B 3.75 x 10^{5} N
C 6.25 x 10^{-1} N
D 6.25 x 10^{0} N

4. An object of mass 20 kg is travelling at a constant speed of 6.0 m s^{-1}.
It collides with an object of mass 12 kg travelling at a constant speed of 15 m s^{-1} in the opposite direction. The objects stick together.
What is the speed of the objects immediately after the collision?

A 1.9 m s^{-1}
B 9.0 m s^{-1}
C 9.4 m s^{-1}
D 21 m s^{-1}

5. A car of mass m with effective power P and initial velocity u climbs a hill of height h. The car arrives at the peak of the hill at velocity v in time t.
Which is true of the motion?

A $Pt + \frac{1}{2} mu^2 = \frac{1}{2} mv^2 + mgh$
B $Pt + \frac{1}{2} mv^2 = \frac{1}{2} mu^2 + mgh$
C $Pt + mgh = \frac{1}{2} mu^2 - \frac{1}{2} mv^2$
D $Pt + mgh = \frac{1}{2} mv^2 - \frac{1}{2} mu^2$

6. Consider a satellite in a circular orbit around the Earth. If it were at an altitude equal to twice the radius of the Earth, $2R_E$, how would its speed v be related to the Earth's radius R_E and the magnitude g of the acceleration due to gravity on the Earth's surface?

A $v^2 = \frac{gR_E}{9}$

B $v^2 = \frac{gR_E}{3}$

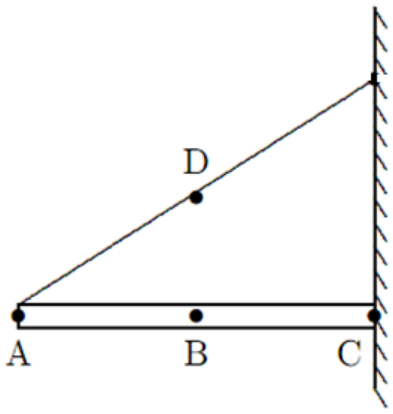
C $v^2 = \frac{gR_E}{2}$

D $v^2 = \frac{gR_E}{4}$

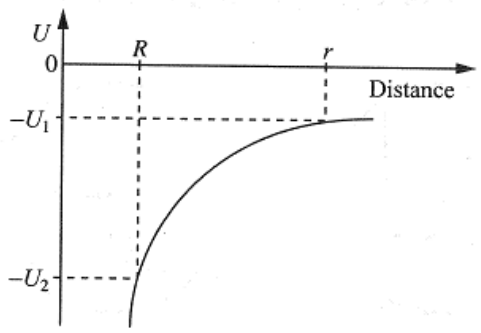
7. The second hand on a watch has a length of 4.50 mm and makes one revolution in 60.0 s. What is the speed of the end of the second hand as it moves in uniform circular motion?

A 9.42×10^{-4} m s^{-1}
B 5.34×10^{-3} m s^{-1}
C 4.71×10^{-4} m s^{-1}
D 2.67×10^{-3} m s^{-1}

8. The diagram shows a stationary 5 kg uniform rod, 1 m long, held against a wall by a rope and friction between the rod and the wall. Use a single equation to find the force exerted on the rod by the rope at which point should you place the reference point for computing torque?



9. The graph below shows the variation of gravitational potential energy U with distance from the Earth's centre for spacecraft. The radius of the Earth is R.



If the spacecraft is orbiting the Earth in an orbit of radius r, the total energy of the spacecraft is

A $-\frac{1}{2}U_1$
B $-\frac{1}{2}U_2$
C $-2U_1$
D $-2U_2$

10. A wire is stretched by a force F which cause an extension l. The energy stored in the wire is ½ *Fl* only if

A the extension of the wire is proportional to the force applied.
B the weight of the wire is negligible.
C the wire is not stretched beyond its elastic limit.
D the acceleration of free fall is constant.

11. If the ideal gas equation $pV_m=RT$ is to be obeyed by a real gas, which of the following states is required?

A The volume of gas is small
B The pressure of gas is low
C The density of gas is high
D The temperature should not exceed 273K

Section B

Answer **all** questions in this section in the space provided.

16 (a)(i)Define work done by a force.

.....

.....

[1 Mark]

(ii) State the relationship between work and energy.

.....

[1 Mark]

(b) A load of 50 N is raised through a height of 0.20 m by a machine that uses a force of 15 N that moves through a distance of 0.80 m. Calculate

(i) work done by the force?

[2 Marks]

(ii) work done by the machine?

[2 Marks]

(iii) efficiency of the machine?

[2 Marks]

Section C
Answer any 2 questions in this section.

18 (a) The kilogram, the Kelvin and the metre are base unit. Name two other base unit [2 marks]

(b) Explain why the unit of power is said to be a derived unit. [1 mark]

(c) (i) The density ρ and the pressure p of a gas is given by $\boldsymbol{c} = \sqrt{\frac{p\gamma}{\rho}}$ where c and γ are constants.

(i) Determine the base units of density ρ. [2 marks]

(ii) Show that the base units of pressure p are kg m^{-1} s^{-2}. [2 marks]

(iii) Given that the constant γ has no unit, determine the unit of c. [2 marks]

(iv) Using your answer to (ii), suggest what quantity may be represented by the symbol c. [1 mark]

(d) when a solid is heated, the thermal energy required is given by,
gain in thermal energy = mass x c x temperature rise , where c is a constant.

(i) Name the quantities in the expression that are base quantities. [1 mark]

(ii) Express in terms of base units, the units of

a) thermal energy [2 marks]

b) the constant c [2 marks]

18 (a) ampere, seconds 1, 1

(b) It is the product of two or more base units. 1

(c) (i) $\rho = \frac{mass, m}{volume, V}$ 1

Base unit of $\rho = \frac{kg}{m^3}$ 1

(ii) $p = \frac{force}{area}$ 1

$= \frac{kgms^{-2}}{m^2}$

$= kg\ m^{-1}\ s^{-2}$. 1

(iii) unit c = $\sqrt{\frac{kgm^{-1}s^{-2}}{kgm^{-3}}}$ 1

$= m\ s^{-1}$ 1

1

(iv) speed or velocity 1

(d) (i) mass, temperature rise1

(ii) (a) thermal energy

= unit of work

= unit of force x displacement 1

$= kg\ m^2\ s^{-2}$ 1

b) the constant *c*

$= \frac{kgm^2s^{-2}}{(kg)K}$ 1

$= m^2\ s^{-2}\ K^{-1}$ 1

TOTAL 15

19 a) An object will remain at rest or move along a straight line with constant speed, unless it is acted upon by a force.

b) The impulse of a constant force is the product of the force and the time duration that it acts

Impulse = Ft

c) i) Change of momentum of car = mv-mu

$=1000(0.8 - 0)$

$=800 kgms^{-1}$

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

RM12.90

BELI SEKARANG >

nightmew.com/p/stpm · FPX online banking · download serta-merta