Name **I/C**

:…… **:……**

PENGGAL 1

960/1 **STPM 2019**

JABATAN PENDIDIKAN NEGERI KELANTAN
SIJIL TINGGI PERSEKOLAHAN MALAYSIA

PHYSICS 1 (FIZIK 1)
MODUL 2

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)	

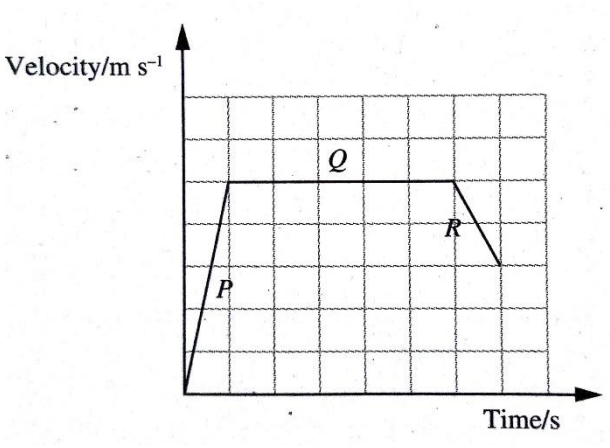
This question paper consists of 11 printed pages and 0 blank pages.
(Kertas soalan ini terdiri daripada 11 halaman bercetak dan 0 halaman kosong.)

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

1 Which pair of quantities contains one vector and one scalar quantity?

A displacement; force
B kinetic energy; power
C acceleration; momentum
D velocity; distance

2



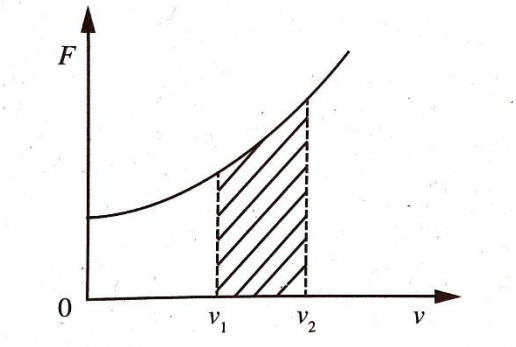
Which statement about the force acting on the car is **not** true?

A A net force acts on the car during interval P.
B No net force acts on the car during interval Q.
C Opposing forces may be acting on the car during interval Q.
D The magnitude of the net force acting during interval P is less than during interval R.

3 A long jumper athlete jumps at an angle of 20.0° to the horizontal with a take-off speed of 11.0ms^{-1}. What is the distance of his jump?

A 3.96 m **B** 4.22 m **C** 7.93 m **D** 12.33 m

4 The variation of the force F produced by an engine of a car with a velocity v is shown in the graph below.



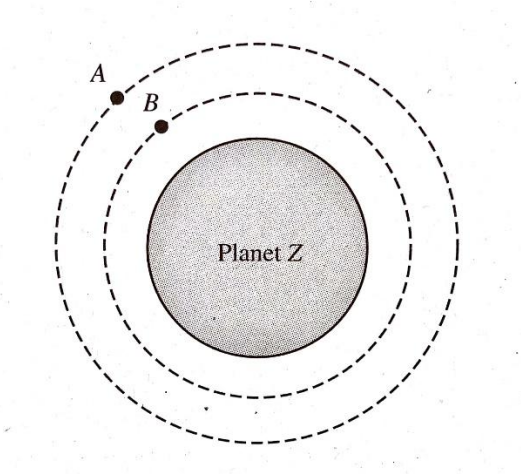
When the velocity of the car increases from v_1 to v_2, the shaded area in the graph represents

A an increase in the power of the car
B an increase in the momentum of the car
C an increase in the work done by the car
D an increase in the kinetic energy of the car

5 An object rests on a disc which rotates at a constant speed. Which statement is true about the object?

A The linear momentum is constant.
B The weight of the object acts as the centripetal force.
C The magnitude of the centripetal acceleration is constant.
D The angular and linear velocities are constant.

6 Two points, A and B, which are at different altitudes from planet Z are shown in the diagram below.



The work done by the gravitational field to bring a spacecraft of mass 5000 kg from A to B is $5 \times 10^{10} J$. What is the gravitational potential at A if the gravitational potential at B is $-5 \times 10^7 Jkg^{-1}$?

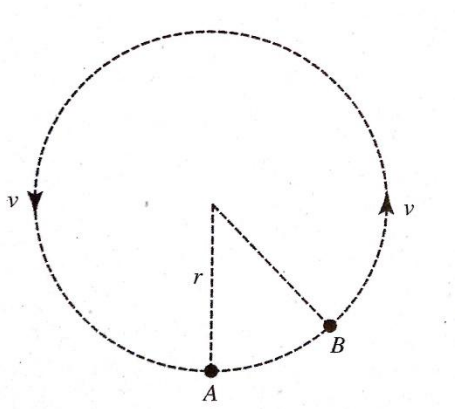
A $-6 \times 10^7 Jkg^{-1}$
B $-5 \times 10^7 Jkg^{-1}$
C $-4 \times 10^7 Jkg^{-1}$
D $-1 \times 10^7 Jkg^{-1}$

Section C
Answer any 2 questions in this section.

18 (a) Derive a relationship between linear velocity, v, and angular velocity, ω, for an object moving in a circle of radius, r.

[3 marks]

(b) A particle moves from position A to position B in a circular path of radius r with constant speed v in time Δt is shown in the diagram below.



(i) Draw a vector diagram for the change in velocity Δv.

[1 mark]

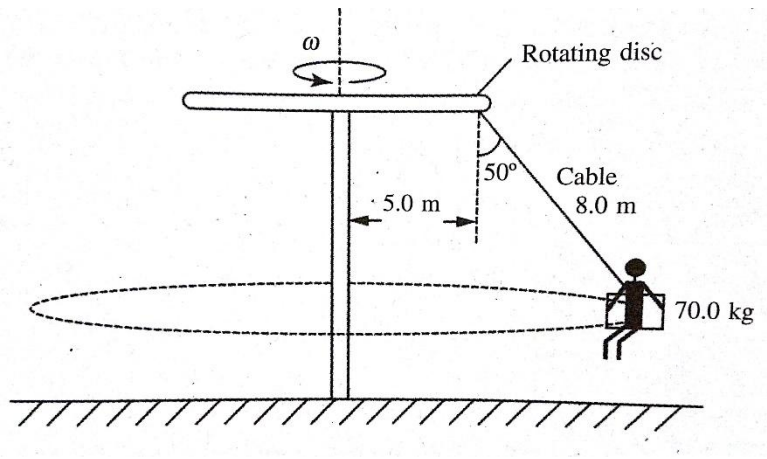
(i) Show that the angle between the velocity vectors at A and B is $\frac{v\Delta t}{r}$

[2 marks]

(ii) Derive the expression for the centripetal acceleration a in terms of v and r.

[2 marks]

(c) A large spinning swing revolving about a vertical axis is shown in the diagram below.



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960/1 **STPM 2019**

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SIJIL TINGGI PERSEKOLAHAN MALAYSIA

PHYSICS 1 (FIZIK 1)
MODUL 2
MARKING SCHEME

Section A [15 marks]

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

	Answer	**mark**
16	(a) $\frac{GMm}{r^2} = \frac{mv^2}{r}$	1
	$r = \frac{GM}{v^2}$	1
	$T = \frac{2\pi r}{v}$	1
	$= \frac{2\pi}{v}\left(\frac{GM}{v^2}\right)$	
	$= 2.94 \times 10^4 s$	1
	b. (i) $g = \frac{GM}{r^2}$	1
	$M = \frac{gr^2}{G}$	
	$= 2.27 \times 10^{24} kg$	1

(ii) $v_e = \sqrt{\frac{2GM}{R}}$

$= \sqrt{\frac{2gR^2}{R}}$ 1

$= 7.78 \times 10^3 ms^{-1}$ 1

TOTAL 8

17 (a) The net force acting on the body is equal to zero. 1

The nett torque about any axis of rotation is equal to zero. 1

1

(b) R is the resultant of static frictional force and normal reaction, N

$T\sin\theta + \mu N = mg$

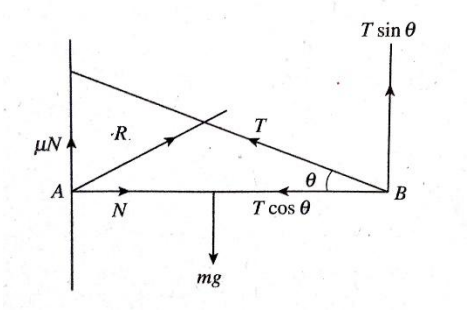
$T\sin\theta = mg - \mu N$ ……...1

1

$T\cos\theta = N$ ……..2

$\tan\theta = \frac{mg - \mu N}{N}$

$\tan\theta = \frac{mg}{N} - \mu$ ……3



1

1

Take moments about B:

Clockwise moments = anticlockwise moments 1

$\mu NL = mg\frac{1}{2}L$

$N = \frac{mg}{2\mu}$

Substitute into 3: $\tan\theta = mg \times \frac{2\mu}{mg} - \mu$

$= \mu$

$= 0.42$

$\theta = 22.78°$

TOTAL 7

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

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