KEAT HWA SECONDARY SCHOOL

Alor Setar, Kedah

2 February 2021

PHYSICS

PAPER 1 (960/1)

SIJIL TINGGI PERSEKOLAHAN MALAYSIA (STPM)

(MALAYSIAN HIGHER SCHOOL CERTIFICATE)

TRIAL EXAM 2021

One and a half hour

DO NOT OPEN THE QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

Instructions to Candidates

1. Answer **all** questions in Section A.
2. Answer **all** questions in Section B.
3. Answer **two** questions only in Section C. You may answer all the questions **but**, only the first **two** answers will be marked.
4. All workings should be shown. For numerical answers, units should be quoted wherever appropriate.
5. Answers may be written in either English or Malay.

Your information

Name : _____

Class : _____

Section A [15 marks]

Answer **all** questions in this section.

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1. Ohm (Ω) is the S.I. unit for resistance. In terms of other units, ohm is equivalent to

A. V A.

B. J C A^{-1}.

C. kg m^2 s^{-3} A^{-2}.

D. kg m^2 s^{-5} A^{-2}.

2. An aeroplane flies horizontally at constant speed of 100 m s^{-1}. It drops a box of food which lands forward on the ground at 600 m. By neglecting air resistance, the height of aeroplane from the ground is

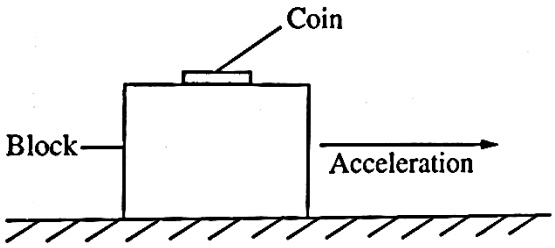
A. 177 m.

B. 240 m.

C. 353 m.

D. 500 m.

3. A coin is placed on top of a block as shown in the diagram below.



If the coefficient of static friction between the coin and the block is 0.30, what is the maximum acceleration of the block so that the coin does not slip?

A. 0.30 m s^{-2}.

B. 2.9 m s^{-2}.

C. 9.8 m s^{-2}.

D. 33 m s^{-2}.

4. Which situation will **not** happen based on Newton's First Law of Motion?

A. A force is required to change the state of motion of an object.

B. When a push is removed from a moving object, the object stops moving.

C. When an object is at rest, the net force acting on the object is equal to zero.

D. When an object moves with constant velocity, the net force acting on the object is equal to zero.

5. The planet Mars moves in a circular orbit with a constant speed. The force acting on the planet is

A. Zero.

B. Parallel with the direction of its motion.

C. In the direction towards the centre of the orbit.

D. In the direction away from the centre of the orbit.

6. A particle of mass 0.020 kg is attached to an elastic string which is fixed at one end on a smooth horizontal table. The length of the string is 0.50 m with force constant 40 N m^{-1}.

When the particle is moving in a horizontal circle of radius 0.65 m, what is the angular velocity of the particle?

A. 21 rad s^{-1}.

B. 24 rad s^{-1}.

C. 45 rad s^{-1}.

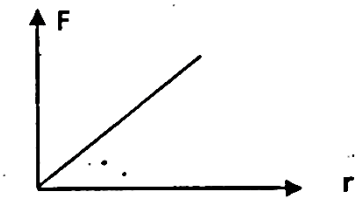
D. 51 rad s^{-1}.

7. Which graph shows the variation of gravitational force, F between two point masses with separation r?

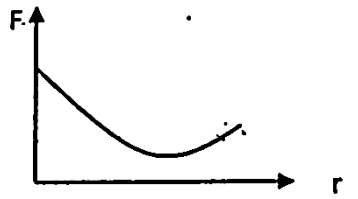
A



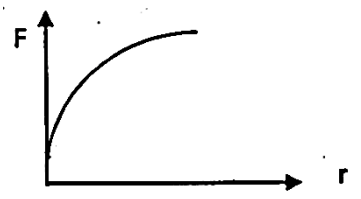
C



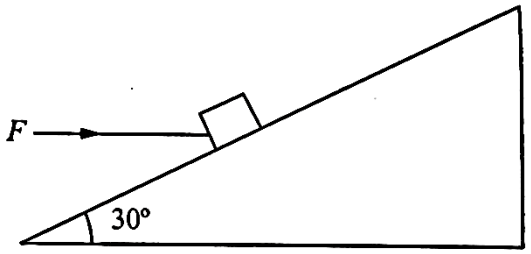
B



D



8. A block which weights 100 N is placed on a smooth inclined plane at an inclination of 30° with the horizontal is shown in the diagram below.



What is the magnitude of the horizontal force, F, acting on the block so that it is in static equilibrium?

A. 50 N.
C. 87 N.
B. 58 N.
D. 100 N.

9. Which property of material is **not** due to plastic deformation?

A. Brittle.
C. Ability to bend.
B. Ductile.
D. Ability to withstand stress.

10. Which statement is **not** about an assumption in kinetic theory for an ideal gas?

A. The loss of kinetic energy during collisions is negligible.
B. The change of momentum during collision with wall is negligible.
C. The time of collision is negligible compared to the time between collisions.
D. The volume of molecules is negligible compared to the volume of the container.

11. What is the r.m.s speed of hydrogen molecules at a pressure of 1.5×10^5 Pa and density of 0.14 kg m^{-3}?

A. 6.0×10^2 m s^{-1}.
C. 3.6×10^5 m s^{-1}.
B. 1.8×10^3 m s^{-1}.
D. 3.2×10^6 m s^{-1}.

12. Five moles of an ideal gas is compressed at a constant pressure and its temperature increases from 300 K to 450 K. The work done in this process is

A. 1.2×10^3 J.
C. 1.2×10^4 J.
B. 6.2×10^3 J.
D. 1.6×10^4 J.

Section B [15 marks]

Answer **all** questions in this section.

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16. (a) A satellite moves in a circular orbit around the Earth at a speed of 4400 m s^{-1}. Determine the orbital period.

[4 marks]

(b) A planet has a radius of 5000 km. The acceleration of free fall of the planet is 6.05 m s^{-2}. Determine the

(i) Mass of the planet.

[2 marks]

(ii) Escape velocity of the planet.

[2 marks]

Section C [30 marks]

Answer **two** questions only in this section.
You may answer all the questions but, only the first two answers will be marked.

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18. (a) (i) Define acceleration.

[1 mark]

(ii) Derive an equation of motion with the intial velocity u, the final velocity v, and the displacement s at a constant acceleration a.

[2 marks]

(b) A driver is driving a car with a velocity of 72 km h^{-1}. Suddenly, a child runs across the road at a distance of 30.0 m in front of his car and he brakes immediately. The driver's response time is 0.50 s.

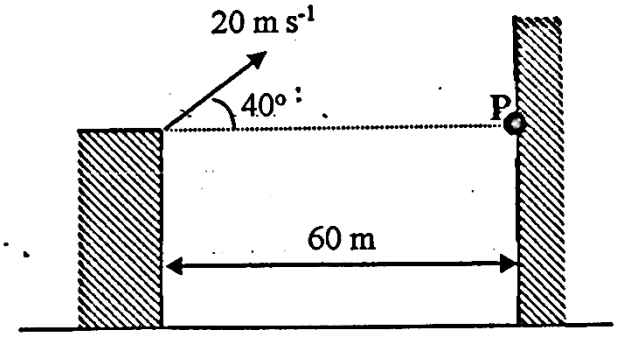
(i) Determine the minimum deceleration of the car so that the child will not get knocked down.

[3 marks]

(ii) Sketch a graph of displacement against time for the motion of the car.

[2 marks]

(c) The figure shows a ball being thrown from the top of a building towards a wall 60 m away. The initial velocity of the ball is 20.0 m s^{-1} at 40° to the horizontal.



(i) How long does it take to hit the wall?

[2 marks]

(ii) What is the distance between P and position of the ball striking the wall?

[2 marks]

(iii) What is the speed of the ball when it strikes the wall?

[3 marks]

19. (a) The formula for the velocity, v of the longitudinal waves which travel along a rod made of material of Young's modulus E, and density ρ is

$$v = \sqrt{\frac{E}{\rho}}$$

Show that the formula is dimensionally correct.

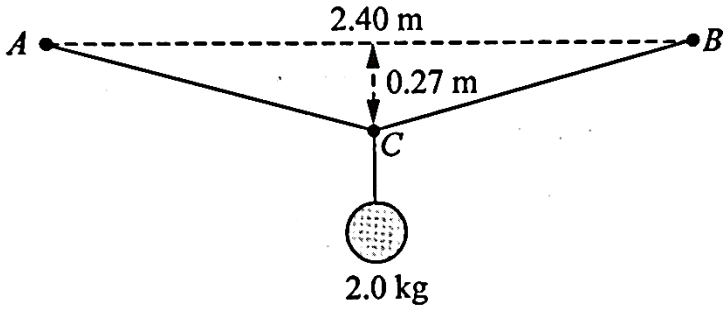
[3 marks]

(b) Sketch a graph of tensile force against extension of a copper wire until it breaks.

Mark the yield point on the graph.

[2 marks]

(c) A uniform wire of original length of 2.40 m is connected to 2 fixed points, A and B, at a horizontal distance of 2.40 m apart as shown in the diagram below.



A mass of 2.0 kg is hung at the midpoint C, of the wire. The equilibrium position of C is 0.27 m below the level of AB. Neglect the weight of the wire and take the Young's modulus for its material as 2.0×10^{11} N m^{-2}.

(i) Calculate the strain of the wire.

[3 marks]

(ii) Calculate the stress in the wire.

[2 marks]

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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