

**SMJK YU HUA KAJANG
PEPERIKSAAN PERTENGAHAN TAHUN 2014**

NAME:.....

FORM: 4

Subject: Physics Paper 2
 Form: 4A – 4F
 Date: 8-5-2014 (Thursday)
 Time: 7.40 – 10.10 (2 ½ Jam)
 No of Candidates: 274
 No of printed Pages:

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 (Penolong Kanan Pentadbiran)

Instruction to candidates

1. This paper is made up of 3 sections; **Section A, Section B and Section C**
2. Answer all questions in **Section A**
3. Write the answers for **Section A** in the space provided in the question paper
4. Answer only 1 question each from **Section B & C**. Answers must be written in the examination pad.
5. Diagrams in this question paper may not be drawn to scale except when stated.
6. Marks allotted for each question is shown below.
7. You are allowed to use non-programmable scientific calculators

Examiners Use			
Section	Question	Full Marks	Marks
A	1	4	
	2	5	
	3	6	
	4	7	
	5	8	
	6	8	
	7	10	
	8	12	
B	9	20	
	10	20	
C	11	20	
	12	20	
TOTAL MARKS			

Section A
 [60 marks]
 Answer all questions in this section

1. Diagram 1 shows a vernier caliper with zero error.

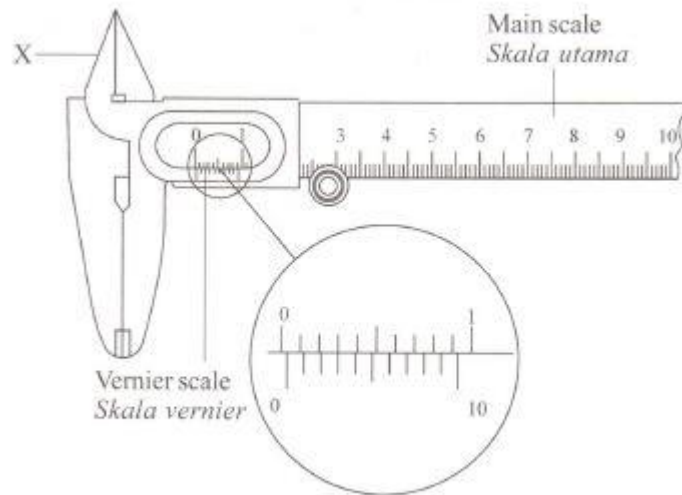


Diagram 1

(a) Underline the correct answer in the bracket to complete the sentence below.

Zero error is an example of (random, systematic) error [1]

(b) Based on Diagram 1

(i) What is the reading of the zero error?

..... cm [1]

(ii) Whats the function of X

..... [1]

(c) When the vernier caliper is used to measure the thickness of a book, the reading is 4.38 cm. What is the actual reading of the measurement?

..... cm [1]

2. Diagram 2 shows the motion of a bowling ball and the bowling pin before and after collision.

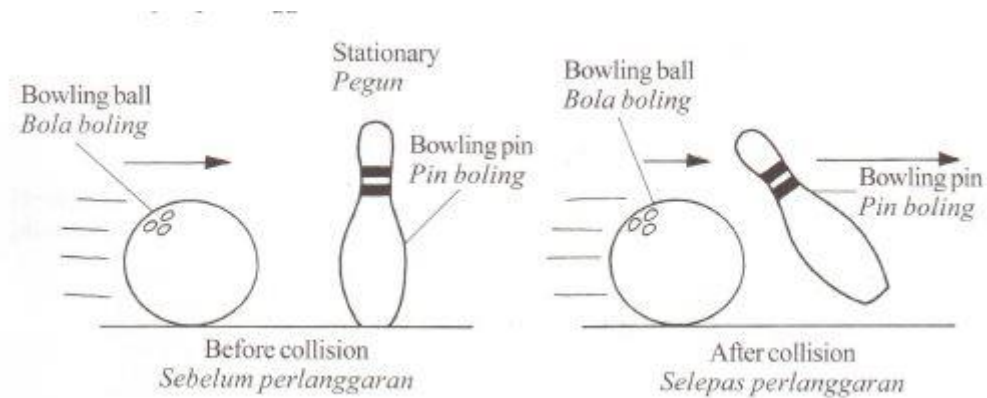


Diagram 2

Table 5 shows the momentum of the bowling ball and the bowling pin before and after collision.

Momentum before collision (kg ms ⁻¹)		Momentum after collision (kg ms ⁻¹)	
Bowling Ball	Bowling Pin	Bowling Ball	Bowling Pin
2.5	0.00	0.4	2.1

Table 2

(a) What is the meaning of momentum?

.....[1]

(b) Based on Diagram 5 and Table 5, determine the total momentum of the bowling ball and the bowling pin

(i) before the collision [1]

(ii) after the collision [1]

(c) Compare the answers in 2 (b) (i) and 2 (b) (ii)

..... [1]

(d) (i) Name the physics principle involved

..... [1]

3. Diagram 3.1 shows a trolley moving down an inclined plane. The ticker timer vibrates at a frequency of 50 Hz. Diagram 3.2 shows the ticket tape produced by the motion of the trolley.

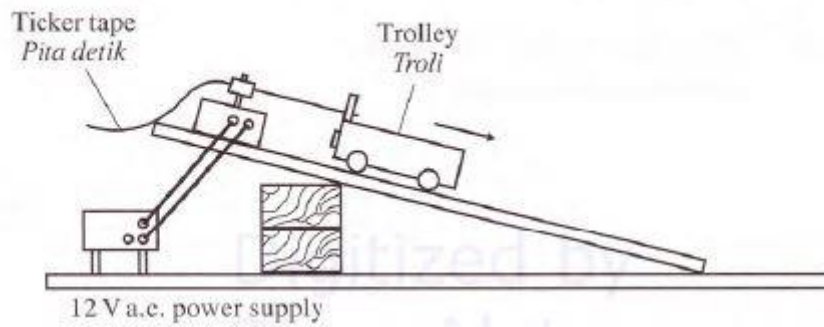


Diagram 3.1

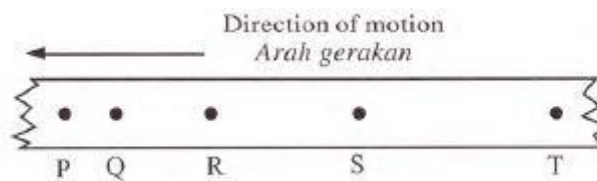


Diagram 3.2

- (a) If the distance of PQ = 0.5 cm and the distance of ST is 0.8 cm, calculate
- (i) The initial velocity, u in cm s^{-1} [1]
 - (ii) The final velocity, v in cm s^{-1} [1]
 - (iii) Determine the acceleration of the trolley in ms^{-2} [1]
- (b) State the type of motion of the trolley
 [1]
- (c) If the mass of the trolley is 1.5kg, calculate the net force acting on the trolley
 [1]
- (d) Let us say that we have changed the ticker timer frequency to 25 Hz. What would be the new distance of ST.
 [1]

4. Diagram 4.1 shows a mother pushing a baby stroller of mass 8kg with a constant force of 20N.

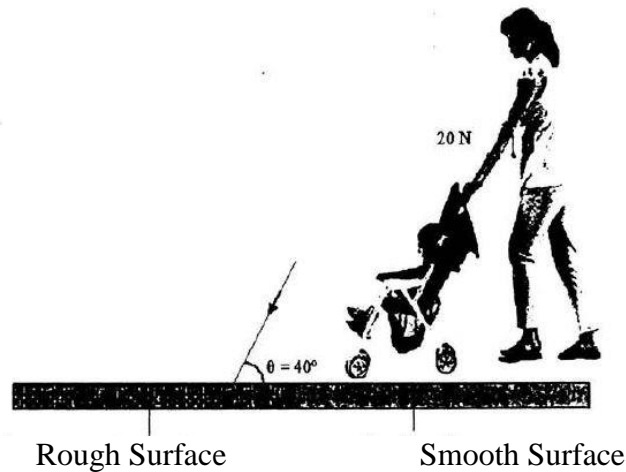


Diagram 4.1

- (a) Define Force?
 [1]
- (b) Based on Diagram 4.1,
- (i) Calculate the horizontal component of the Force that causes the stroller to move forward.
 [1]
- (ii) Calculate the vertical component of the force that causes the stroller to be heavier
 [1]
- (iii) Determine the reaction force acting on the stroller (Show a Free Body diagram of the forces acting) [1]
- (c) Calculate the acceleration of the stroller on the smooth surface.
 [2]
- (d) Complete the following sentence by **underlining** the correct word
 When the stroller moves on the rough surface. The net force acting on the stroller (**increases , decreases, remains unchanged**) [1]

5. Mei Lan cycles to work everyday. The graph on Figure 5.1 shows a typical velocity-time graph of Mei Lan's journey to work.

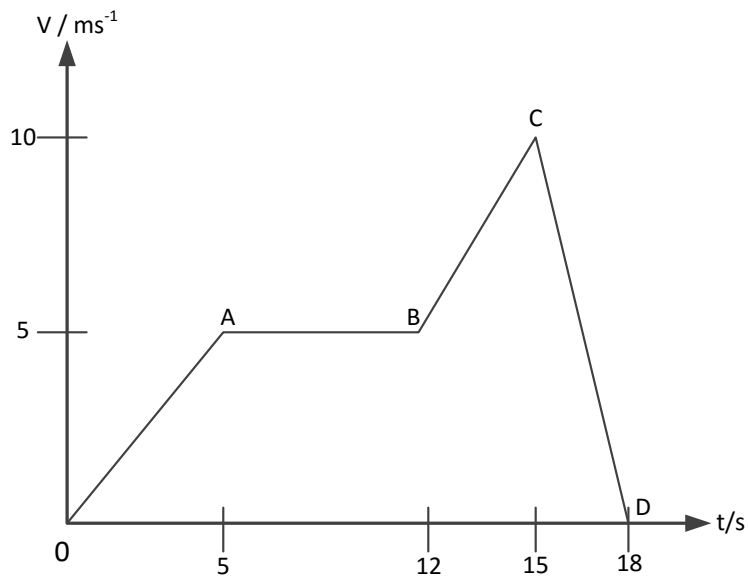


Figure 5.1

- (a) Describe the following part of Mei Lan's movement
- (i) A to B: [1]
 - (ii) B to C:..... [1]
 - (iii) C to D:..... [1]
- (b) Calculate the acceleration of the bicycle for the first 3 seconds
-
- [2]
- (c) Calculate the total distance travelled
-
- [2]
- (d) Determine the average velocity for the whole journey
-[1]

6. Figure 6.1 shows a moving car. The car has a mass of 1500kg. Two force acting on the car as shown in Figure 6.1 when it was moving.

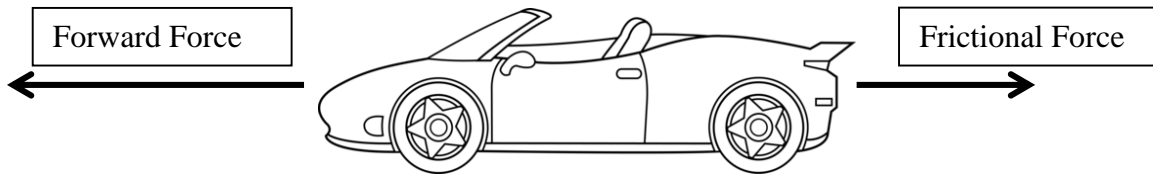


Figure 6.1

- (a) Give the relationship between the forward force F_w and the frictional force (F_R) in the following situation
- (i) Constant velocity
 [1]
 - (ii) Constant acceleration
 [1]
 - (iii) Constant deceleration
 [1]
- (b) If the forward force cause by the engine of the car is 20,000 N and the car accelerates at 5 ms^{-2} , find the frictional force acting on the car [2]
- (c) If the car meets with an accident while travelling at 110 kmh^{-1} , and was stopped in a time of 0.5 seconds, calculate the impulsive force on the car [2]
- (d) Suggest 2 ways to reduce the impulsive force calculated in (c)
- Way 1:..... [1]
- Way 2:..... [1]

7.