

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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Pearson Edexcel International Advanced Level

Time 1 hour 30 minutes

Paper

reference

WME01/01

Mathematics

International Advanced Subsidiary/Advanced Level Mechanics M1

Oct/Nov 2022

You must have:

Mathematical Formulae and Statistical Tables (Yellow), calculator

Total Marks

Candidates may use any calculator permitted by Pearson regulations. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- You should show sufficient working to make your methods clear. Answers without working may not gain full credit.
- Whenever a numerical value of g is required, take $g = 9.8 \text{ m s}^{-2}$, and give your answer to either 2 significant figures or 3 significant figures.

Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- There are 8 questions in this question paper. The total mark for this paper is 75.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.
- If you change your mind about an answer, cross it out and put your new answer and any working underneath.

Turn over ►

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B:1/1/1/




Pearson

- (a) the common speed of the railway trucks immediately after the collision, (2)
- (b) the magnitude of the impulse exerted on S in the collision, stating the units of your answer. (3)

Question 1 continued

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Q1

(Total 5 marks)



Question 2 continued

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Question 2 continued

Lined area for writing the answer to Question 2.



Question 2 continued

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Q2

(Total 6 marks)



Question 3 continued

Handwriting practice area with 30 horizontal lines.

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Question 3 continued

Lined area for writing the answer to Question 3.



Question 3 continued

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Lined area for writing the answer to Question 3.

(Total 11 marks)

Q3

Grading box for Q3.



Question 4 continued

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Question 4 continued

Handwriting practice area with 25 horizontal lines.



Question 4 continued

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Q4

(Total 6 marks)



P 7 2 1 5 1 A 0 1 5 3 2

- (a) Find the distance travelled by the ball while its speed is less than 14.7 m s^{-1} (3)
- (b) Find the time for which the ball is moving with a speed of more than 29.4 m s^{-1} (3)
- (c) Sketch a speed-time graph for the motion of the ball from the instant when it is projected from *A* to the instant when it hits the ground. Show clearly where your graph meets the axes. (3)

Question 5 continued

Handwriting practice area with 30 horizontal lines.

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Question 5 continued

Handwriting practice area with 25 horizontal lines.



Question 5 continued

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Q5

(Total 9 marks)



(b) find the speed of A at time $t = 4$ seconds. (5)

Question 6 continued

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Question 6 continued

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Question 6 continued

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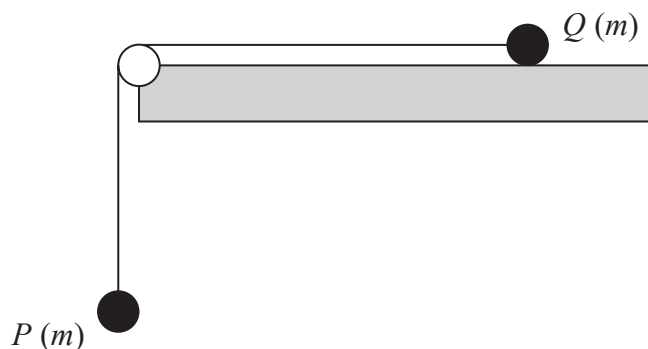
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Q6

(Total 9 marks)



7.

**Figure 4**

A particle P of mass m is attached to one end of a light inextensible string. Another particle Q , also of mass m , is attached to the other end of the string. The string passes over a small smooth pulley which is fixed at the edge of a rough horizontal table. Particle Q is held at rest on the table and particle P hangs vertically below the pulley with the string taut, as shown in Figure 4.

The pulley, P and Q all lie in the same vertical plane.

The coefficient of friction between Q and the table is μ , where $\mu < 1$

Particle Q is released from rest.

The tension in the string before Q hits the pulley is kmg , where k is a constant.

(a) Find k in terms of μ .

(7)

Given that Q is initially a distance d from the pulley,

(b) find, in terms of d , g and μ , the time taken by Q , after release, to reach the pulley.

(4)

(c) Describe what would happen if $\mu \geq 1$, giving a reason for your answer.

(2)



Question 7 continued

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Question 7 continued

Lined area for writing the answer to Question 7.



Question 7 continued

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Lined area for writing the answer to Question 7.

(Total 13 marks)

Q7



- The velocity of A is $(3\mathbf{i} + 12\mathbf{j})\text{ km h}^{-1}$ and the velocity of B is $(p\mathbf{i} + q\mathbf{j})\text{ km h}^{-1}$

(2)

At time t hours after 12 noon,

$$\overrightarrow{AB} = [(25 - 12t)\mathbf{i} - 9t\mathbf{j}] \text{ km}$$

(7)

(7)

Question 8 continued

Handwriting practice area with 30 horizontal lines.

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Question 8 continued

Lined area for writing the answer to Question 8.



Question 8 continued

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TOTAL FOR PAPER: 75 MARKS

32

