

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

January 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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Pearson

Question 1 continued

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Q1

(Total 6 marks)



- (3)

Question 2 continued

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Q2

(Total 7 marks)



Question 3 continued

Handwriting practice area with horizontal lines.

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Question 3 continued

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Question 3 continued

Lined area for writing the answer to Question 3.

(Total 7 marks)

Q3



- The ball is modelled as a particle moving freely under gravity.

- (b) Sketch a speed-time graph for the motion of the ball from $t = 0$ to $t = T$ seconds.

Question 4 continued

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Question 4 continued

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Question 4 continued

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Q4

(Total 8 marks)



P 6 8 7 8 3 A 0 1 3 2 8

Question 5 continued

Handwriting practice area with 25 horizontal lines.

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Question 5 continued

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Question 5 continued

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Q5

(Total 8 marks)



P 6 8 7 8 3 A 0 1 7 2 8



Question 6 continued

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Question 6 continued

Lined area for writing the answer to Question 6.



Question 6 continued

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Lined area for writing the answer to Question 6.

(Total 12 marks)

Q6



7.

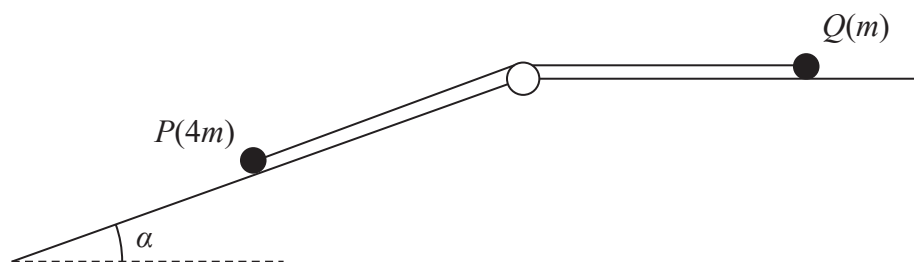


Figure 4

A particle P of mass $4m$ lies on the surface of a fixed rough inclined plane.

The plane is inclined to the horizontal at an angle α where $\tan \alpha = \frac{3}{4}$

The particle P is attached to one end of a light inextensible string.

The string passes over a small smooth pulley that is fixed at the top of the plane. The other end of the string is attached to a particle Q of mass m which lies on a smooth horizontal plane.

The string lies along the horizontal plane and in the vertical plane that contains the pulley and a line of greatest slope of the inclined plane.

The system is released from rest with the string taut, as shown in Figure 4, and P moves down the plane.

The coefficient of friction between P and the plane is $\frac{1}{4}$

For the motion before Q reaches the pulley

- (a) write down an equation of motion for Q , (1)
- (b) find, in terms of m and g , the tension in the string, (7)
- (c) find the magnitude of the force exerted on the pulley by the string. (4)
- (d) State where in your working you have used the information that the string is light. (1)



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



- (2)

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Question 8 continued

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Q8

TOTAL FOR PAPER: 75 MARKS

28

