

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Pearson Edexcel
International
Advanced Level

Centre Number

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Candidate Number

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Monday 21 January 2019

Afternoon (Time: 1 hour 30 minutes)

Paper Reference **WME01/01**

Mechanics M1
Advanced/Advanced Subsidiary

You must have:

Mathematical Formulae and Statistical Tables (Blue)

Total Marks

Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. 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). Coloured pencils and highlighter pens must not be used.
- **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 two significant figures or three significant figures.
- When a calculator is used, the answer should be given to an appropriate degree of accuracy.

Information

- 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.

Turn over ►

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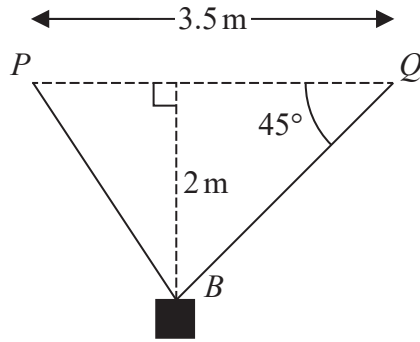


Figure 3

A small metal box of mass 6 kg is attached at B to two ropes BP and BQ . The fixed points P and Q are on a horizontal ceiling and $PQ = 3.5$ m. The box hangs in equilibrium at a vertical distance of 2 m below the line PQ , with the ropes in a vertical plane and with angle $BQP = 45^\circ$, as shown in Figure 3. The box is modelled as a particle and the ropes are modelled as light inextensible strings. Find

- (i) the tension in BP ,
- (ii) the tension in BQ .

(10)

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6. A train travels for a total of 270 s along a straight horizontal track between two stations A and B . The train starts from rest at A and moves with constant acceleration for 60 s until it reaches a speed of $V \text{ m s}^{-1}$. The train then travels at this constant speed $V \text{ m s}^{-1}$ before it moves with constant deceleration for 30 s, coming to rest at B .

(a) Sketch below a speed-time graph for the journey of the train between the two stations A and B .

(2)

Given that the distance between the two stations is 4.5 km,

(b) find the value of V ,

(3)

(c) find how long it takes the train to travel from station A to the point that is exactly halfway between the two stations.

(4)

The train is travelling at speed $\frac{1}{4} V \text{ m s}^{-1}$ at times T_1 seconds and T_2 seconds after leaving station A .

(d) Find the value of T_1 and the value of T_2

(5)

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