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Examiners' Report

Summer 2014

Pearson Edexcel GCE in Mechanics 5R (6681/01R)

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Mathematics Unit Mechanics 5

Specification 6681/01R

General Introduction

All of the students seemed to find the paper to be of a suitable length, with no evidence of students running out of time. The majority of the students were very well prepared.

The paper discriminated well at all levels including the top end where there were some impressive, fully correct solutions seen to all questions. Generally, students who used large and clearly labelled diagrams and who employed clear, systematic and concise methods were the most successful.

In calculations the numerical value of g which should be used is 9.8, as advised on the front of the question paper. Final answers should then be given to 2 (or 3) significant figures – more accurate answers will be penalised, including fractions. If there is a printed answer to show then students need to ensure that they show sufficient detail in their working to warrant being awarded all of the marks available. In all cases, as stated on the front of the question paper, students should show sufficient working to make their methods clear to the Examiner.

If a student runs out of space in which to give their answer than they are advised to use a supplementary sheet – if extra paper is unavailable then it is crucial for the student to say whereabouts in the script the extra working is going to be done.

Report on Individual Questions

Question 1

The most popular way to approach this question was using a scalar product and the work-energy principle and it proved to be an easy starter for the majority. Other approaches were unsuccessful.

Question 2

Most candidates applied the conservation of energy principle correctly and were then able to convert the angular speed into a linear speed. There were some problems with the distances involved in the energy equation.

Question 3

This question was successfully answered by the majority of students, with only a few demonstrating that they knew little about the concept of conservation of angular momentum and/or how to apply Newton's Law of Restitution to such a scenario.

Question 4

This question was answered completely correctly by the majority of the students. However, a few were unable to make much progress and struggled to obtain a correct expression for the moment of inertia of an elemental disc.

Question 5

This question proved to be a good source of marks for the majority of students. The integrating factor method was well known and correctly applied to find the general solution of the differential equation. The initial conditions were then used to find the required particular solution. Sometimes the trigonometry involved defeated a minority of the students.

Question 6

This question was extremely well answered by all of students. The first two marks in Q06(a) were scored by all. In the second part, the methods were well known but there were a few errors made in evaluating the vector products required and this led to a final incorrect answer for **G**.

Question 7

The printed answer given Q07 (a) was easily obtained by most students but a minority did not really know where to start. In the second part, those who were unsuccessful in Q07(a) were able to go on and obtain credit for rearranging and solving the given differential equation. However, the integral involved defeated some candidates.

Question 8

This was a challenging question and provided discrimination at the top end. The first part was answered very well by some but for others, it proved to be a very challenging. For those who were unsuccessful in Q08(a), the second part provided a potential opportunity to go on and obtain some marks but this was not always taken advantage of. The same also applied to Q08(c) and the final part was answered correctly by only the most able students.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx

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