Generic feedback 1Mech/1Mech2 exam 2024

Students in general struggled with this paper, with a low average raw mark, which varied between 0% and 89%. Whilst some students had clearly learnt and understood the material from the course very well, others had not appreciated the level of preparation required. There were a few very good attempts at the bookwork parts of the questions which showed excellent understanding, but a lot of students seemed unfamiliar with the material and didn't know where to start, attempted to prove something else from the course that was unrelated or used the answer within their proof making a circular argument. Overall scripts contained notational inconsistencies or a lack of clarity around presentation, e.g. underlining things that weren't vectors or vice versa, and basic technical skills such as integration let some students down. To improve your exam performance going forward, make sure you read the question! If it says you can assume something, then don't waste time proving it – you don't have time to spare in these exams. Similarly, if it says to start from Newton's second law then that is the approach you should take, other approaches are unlikely to get you much credit.

Breakdown by question:

Qn 1a) considered dimensional homogeneity which was generally well done, although some students gave confused answers mixing units and dimensions.

b) This was a straightforward question looking at kinematics in one dimension. Most students did this well, although a number struggled with integrating correctly and not all answers were clear in their derivations.

c) This was bookwork but was surprisingly challenging for most students.

d) This question looked at deriving a central force problem, with the main focus on finding the initial conditions in terms of time and translating them into theta space. Lots of answers tried to derive the equation for u from first principles, despite it being given in the question, and then neglected to find the initial conditions in terms of theta where most of the marks were allocated. Many showed a lack of understanding about what they were doing leading to mistakes.

Q2a) This was again bookwork which proved surprisingly challenging.

b) The setup for this question was different from examples seen in lectures, but parts (i)-(iv) led students through the derivation required, and part (v) could be tackled without having done the rest successfully. Those who attempted this part often did reasonably, with some very good answers, but lots of scripts did not attempt much of the question. Hardly anyone used the hint given, which would have helped significantly for the final part!