Generic feedback 1Mech 2022

The final exam was mainly well done, with a lot of students showing good engagement and understanding of the material. Section A was more consistently tackled than section B, which saw a wide variety in the quality of the attempts from near perfect to hardly any of the question being answered.

Where students typically did well

Question 1: parts (a), (b) and (d) were generally done well, with good understanding demonstrated. Those that attempted d(iii) often did very well, showing some good insight.

Question 2: There were many excellent and clear derivations for part (a), and most candidates could successfully solve the ODE to find u. Those that got to part (d) and attempted it with the correct expression for r typically did well.

Where students typically could have improved

General: There was a lot of inconsistent vector notation - make it clear what is a vector, and you can't set vectors equal to scalars! Simple arithmetic or algebraic errors were common, often making the question a lot harder to answer. Sense check your answers as you're going along to try and catch errors early (e.g. think about dimensions). A number of answers would have been improved by clearer explanations and more accurate use of notation.

Question 1: Marks were typically lost for elements linking with the real world, in particular when the question asked about physical meaning. Confusion about initial conditions (e.g. that you have to set t=0) caused some problems. A number of people said that if a variable was constant at t=0 then its derivative with respect to t must also be zero - this is not true!

Question 2: A number of scripts showed confusion about the bookwork asked in part (a), with some students writing down the generic form for u rather than deriving it from Newton's second law. The direction of the argument that h is constant tripped some people up. The initial conditions required for part (b) were typically challenging, particularly being clear about the change of variables between t and θ.

Silly errors in part c) lead to more challenging to understand expressions for r which made part d) harder. A number of people demonstrated confusion between initial conditions, the constant h and the solution to the ODE.