

THREE

Discussion could include, but is not limited to, items such as the following:

- a) The use of FEA can be used to significantly reduce the number of prototypes needed in product development. Instead of building physical prototypes, virtual prototypes can be built and tested. This significantly reduces the time and the expense of building prototypes. However, some physical prototypes will probably still be needed to correlate the FE models to gain confidence in these models and to 'sign-off' the final design. In an ideal world, no prototype tooling would be necessary, instead the manufacturer would go straight to production tooling.
- b) FEA can be used at a conceptual stage to judge the performance of a design without incurring the expense of having to produce 3D CAD within a CAD package. This means that the performance and the cost of the proposed design can be understood by both the supplier and the potential customer when making a decision as to which conceptual design to develop further, this is particularly relevant to suppliers who are often producing concepts to 'quote for business' at their own expense. The use of FEA at a conceptual stage significantly reduces the cost of producing these as discussed in part (a). Once a conceptual design has been decided upon this can be used to take the design through to production. It is at this stage that other analytical tools such as moldflow analysis would need to be considered further, however, the original geometry from the conceptual design can still be used to inform the design.
- c) The use of FEA has traditionally been used as a verification tool. That is to say that a component has been produced using experience and judgement of a designer and the performance of this component is assessed in an FE environment and this is then iterated until the performance of the component meets the design specification. A better use of FEA is to use it as a design tool, using optimisation techniques (such as topology), to inform the design thus ensuring, for example, that no major loadpaths are missed. By doing this the design will be a more efficient solution. This is a particularly powerful tool when applied to conceptual designs as discussed in part (b).