Design & Technology
(Product Design)

DTBase©

OCR A-Level

Using Digital Design Software in Development (4.2b)

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- For the multiple choice questions, circle your answer

Advice

- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don’t spend too much time on one question

Good luck!

Q1. What is the primary distinction between rendering for visual presentation and using simulation software?

A Rendering creates images; simulation tests function.

B Rendering is cheaper; simulation is more expensive.

C Rendering uses less processing power.

Q2. Which digital design activity would be used to predict if a plastic gear will deform under continuous torque?

A Photo-quality imaging

B Finite Element Analysis (FEA)

C Exploded view rendering

Q3. Creating an animated video that shows how a folding mechanism works is an example of:

A Scientific analysis

B Product simulation

C Material selection

Q4. A designer uses software to test how a chair design distributes a person's weight. This process is called:

A Visual presentation

B Stress analysis

C Colour rendering

Q5. The designer of the frying pan used digital design software in the development of the design.

Discuss the role of digital design software during design development.

Refer to specific examples in your answer. **(6 marks)**

Answers

Q1. A
Q2. B
Q3. B
Q4. B

Q5.

Indicative content:

- Mathematical modelling is used to optimise the design The results can also be presented as graphs and charts.
- Generative design tools produce optimum forms e.g. Adidas 3D printing customised midsoles for their runners or airbus to achieve lightest, strongest design that uses the minimal amount of material.
- Communication of ideas through visual presentation, rending and photo quality rendering.
- Online collaboration to discuss and exchange ideas with experts and/or other designers. This could also include discussing ideas/ designs with stakeholders.
- Product simulation and testing, and test weak areas that may fail, (Finite Element Analysis (FEA).
- Scientific analysis of real-world physical factors to determine whether a product will work in the way it's intended. This can also be used to optimise the design.
- Rapid prototyping such as 3D printing can be used to test ideas.
- Any other valid suggestion.