Advance Information for Summer 2022

A Level

Design and Technology

H404

Principles of Design Engineering/Problem Solving in Design Engineering

We have produced this advance information to support teachers and students with revision for the Summer 2022 examinations.

Information

- This notice covers Components 01 and 02 only.
- This notice does **not** cover non-examined assessment (NEA) components.
- There are no restrictions on who can use this notice.
- The format/structure of the paper remains unchanged.
- You are **not** permitted to take this notice into the exam.
- This document has **5** pages.

Advice

- Students and teachers can discuss this advance information.
- It is advised that teaching and learning should still cover the entire subject content in the specification.

If you have any queries about this notice, please call our Customer Support Centre on **01223 553998** or email general.qualifications@ocr.org.uk.

H404/01 Principles of Design Engineering

- This list shows the topics that will be mainly, although not exclusively, tested through the higher tariff questions.

- The topics listed are taken from the specification content that is set out through an enquiry approach. These are not examination questions.

- Students and teachers should consider how to focus their revision of other parts of the specification which may be tested in other questions.

1. Identifying requirements

1.3 How can usability be considered when designing prototypes?

2. Learning from existing products and practice

2.1 Why is it important to analyse and evaluate products as part of the design and manufacturing process?

3. Implications of wider issues

3.1 What factors need to be considered when designing and manufacturing products to overcome possible conflicts between moral and commercial factors?

3.2 What factors need to be considered when developing design solutions for manufacture?

3.5 What energy factors need to be considered when developing design solutions?

4. Design thinking and communication

4.2 How do industry professionals use digital design tools to support and communicate the exploration, innovation and development of design ideas?

4.3 How do design engineers use different approaches to design thinking to support the development of design ideas?

6. Technical understanding

6.2 How do mechanisms provide functionality to products and systems?

6.3 What forces need consideration to ensure structural and mechanical efficiency?

6.4 How can electronic systems offer functionality to design solutions?

b. Demonstrate an understanding of the function of an overall system.

e. Demonstrate an understanding of the basic principles of electricity.

6.5 How can programmable devices and smart technologies provide functionality in system design?

b. Demonstrate an understanding of how programmable devices are used to add functionality to products, relating to coding of and specific applications of programmable components.

8. Viability of design solutions

8.1 How can design engineers assess whether a design solution meets its stakeholder requirements?

a. Critically evaluating how a design solution has met its intended requirements.

8.3 How do design engineers and manufacturers determine whether design solutions are commercially viable?

H404/02 Problem Solving in Design Engineering

- This list shows the topics that will be mainly, although not exclusively, tested through the higher tariff questions.

- The topics listed are taken from the specification content that is set out through an enquiry approach. These are not examination questions.

- Students and teachers should consider how to focus their revision of other parts of the specification which may be tested in other questions.

1. Identifying requirements

1.2 What can be learnt by undertaking stakeholder analysis?

2. Learning from existing products and practice

2.2. Why is it important to understand technological developments in design engineering?

2.4 What can be learnt by examining lifecycles of products?

3. Implications of wider issues

3.4 What factors need to be considered when distributing products to markets?

a. Understand the issues related to the effective and responsible distribution of products.

4. Design thinking and communication

4.1 How do designer engineers use annotated 2D and 3D sketching and digital tools to graphically communicate ideas?

6. Technical understanding

6.4 How can electronic systems offer functionality to design solutions?

6.5 How can programmable devices and smart technologies provide functionality in system design?

b. Demonstrate an understanding of how programmable devices are used to add functionality to products, relating to coding of and specific applications of programmable components.

8. Viability of design solutions

8.3 How do design engineers and manufacturers determine whether design solutions are commercially viable?

END OF ADVANCE INFORMATION