

R038 Engineering Examination

OCR Cambridge National Engineering Design

Course Code: J822

RO39 – Communicating Design Idea 30% (Completed Yr 10)

RO40 – Modelling and Evaluation 30% (Hand in March 2026)

RO38 – Examination 40% **Tuesday 12th May 2026 = 40%**

How to be Examination Ready:

- Have an overview of what is expected to be learned
- Look through the previous trial mocks and ensure you apply all FOT
- Know the differences between the design brief, design specification and Engineering Specifications
- Know ACCESSFM
- Make notes around certain processes such as marking out, 3d printing, laser cutting, injection moulding, vacuum forming

Preparation Materials provided December 2025

- Revision Guide
- Past Papers and Mark Schemes
- Upload PPT lessons available on G.C.
- Technical Drawing practice booklets and exercises
- Working examples
- Trial Mock Exam FOT
- Walking Talking Mock (March 2026)
- Engineering Matrix examples

Key Components of the Exam:

<p>1.1 The stages involved in design strategies</p> <p><i>To include:</i> • The context in which each strategy might be applied • The relative advantages and disadvantages of each strategy</p>	<p>□ Linear design □ Iterative design □ Inclusive design □ User-centred design □ Sustainable design □ Ergonomic design</p>
<p>2.1 Design</p> <p>Stages of the iterative design process, and the activities carried out within each stage of this cyclic approach</p> <p><i>To include:</i> • Relative advantages and disadvantages of primary and secondary research for product requirements • How the information obtained from each method contributes to the design process • Generation of design</p>	<p>□ Analysis of the design brief □ Methods of researching the product requirements ♣ types of information obtained from primary research ♣ types of information obtained from secondary research ♣ market research to determine existing products ♣ interviews with potential users and focus groups ♣ use of tables of anthropometric data ♣ analysis of existing products using: o ACCESS FM (Aesthetics, Cost, Customer, Environment, Size, Safety, Function, Materials and</p>

<i>ideas may refer to the creation of the initial design or to the modification/ improvement of the existing design</i>	Manufacturing) o product disassembly □ Production of an engineering design specification □ Generation
1.2.2 Make and evaluate:	□ The reasons for the use of modelling ♣ to test proportions ♣ to test scale ♣ to test function □ Virtual modelling of the design idea □ Physical modelling of the design idea □ Manufacture or modification of the prototype ♣ comparison of the model or prototype against the requirements
2.1 Types of criteria included in an engineering design specification <i>To include: • The difference between needs and wants • The difference between quantitative data and qualitative data</i>	□ Needs and wants □ Quantitative and qualitative criteria □ Reasons for the product criteria included in the design specification (ACCESS FM): ♣ Aesthetics ♣ Cost ♣ Customer ♣ Environment ♣ Size ♣ Safety ♣ Function ♣ Material ♣ Manufacturing
2.2 How manufacturing considerations affect design <i>To include: • Typical products manufactured at different scales of manufacture</i>	□ Scale of manufacture: ♣ one-off ♣ batch ♣ mass □ Material availability and form □ Types of manufacturing processes: ♣ wasting ♣ shaping ♣ forming ♣ joining ♣ finishing ♣ assembly □ Production costs ♣ labour ♣ capital cost
3.1 Types of drawing used in engineering <i>To include: • The typical applications and relative advantages and disadvantages of each drawing technique</i>	□ Freehand sketching □ Isometric □ Oblique □ Orthographic drawings □ Exploded views □ Assembly drawings □ Block diagrams □ Flowcharts □ Circuit diagrams □ Wiring diagrams
3.2 Working drawings <i>To include: • Standard conventions in BS 8888 and how these are applied</i>	2D engineering drawings using third angle orthographic projection □ Standard conventions ♣ title block ♣ metric units of measurement ♣ scale ♣ tolerance □ Standard conventions for dimensions: ♣ linear measurements ♣ radius ♣ diameter ♣ surface finish □ Meaning of line types: ♣ outlines ♣ hidden detail ♣ centre line ♣ projection ♣ dimension ♣ leader line To include: • Standard conventions in BS 8888 and how these are applied 18 © OCR 2023 Version 4 (August 2023) OCR Level 1/Level 2 Cambridge National in Engineering Design Unit R038: Principles of engineering design □ Abbreviations: ♣ across flats ♣ centre line ♣ diameter ♣ drawing ♣ material ♣ square □ Representations of mechanical features: ♣ threads ♣ holes ♣ chamfers ♣ countersinks ♣ knurls
3.3 Using CAD drawing software	Advantages and limitations of using CAD drawing software compared to manual drawing techniques
4.1 Methods of evaluating design ideas	□ Production of models □ Qualitative comparison with the design brief and specification □ Ranking matrices □ Quality Function Deployment (QFD)
4.2 Modelling methods	□ Virtual (3D CAD) □ Card □ Block □ Breadboarding □ 3D printing
4.3 Methods of evaluating a design outcome	□ Methods of measuring the dimensions and functionality of the product □ Quantitative comparison with the design brief and specification □ User testing □ Reasons for identifying potential modifications and improvements to the design
	R040 submitted to OCR

Learning Support:

R040 Coursework Catch up Monday Tuesday Thursday 3:30 – 4:30pm

Exam Revision and 121 support. These sessions will be held Monday & Tuesday evenings 3:15 – 4:15pm From March 2026

You have everything to work for – **BE THE VERY BEST YOU CAN BE!!!**

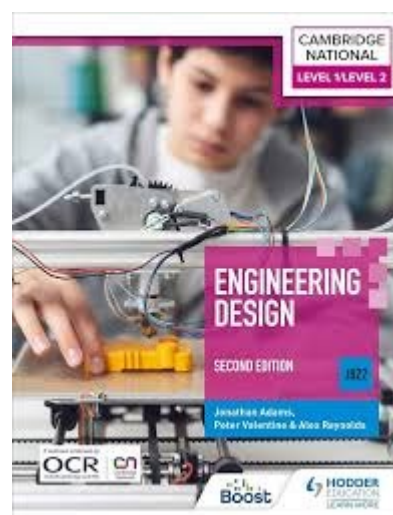
Recommended Books to support learners:

Level 1/Level 2 Cambridge National in Engineering Design (J822): Second

Edition Paperback – 27 May 2022

by Jonathan Adams (Author), Peter Valentine (Author), Alex Reynolds (Author)

- ISBN-10
- 1398350338
- ISBN-13
- 978-1398350335
- Publisher
- Hodder Education
- Publication date 27 May 2022



Level 1/Level 2 Cambridge National in Engineering Design (J822) Exam Practice

Workbook Paperback – 26 May 2023

by Chris Walker (Author)

ISBN-10

1398384712

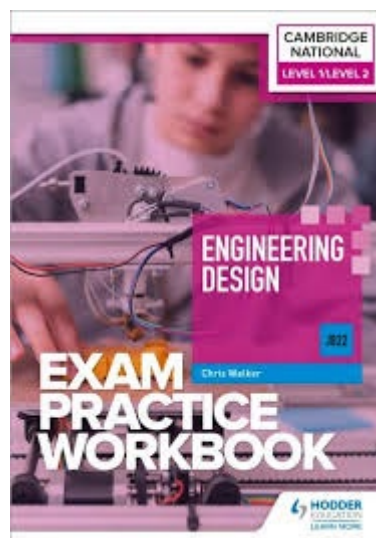
ISBN-13

978-1398384712

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Hodder Education

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Cambridge National in Engineering Design Student

Book with Digital Access (2 Years): Level 1/Level 2

(Cambridge Nationals)

- ISBN-13 978-1009119252
- Publisher Cambridge University Press
- Publication Date 29 Sept. 2022



My Revision Notes: Level 1/Level 2 Cambridge National in Engineering Design