Edexcel A-Level Design & Technology (9DT0) – Exam Technique & Answer Guide

📜 **Paper 1: Principles of Design and Technology**

🗓️ **Duration: 2 hours 30 mins**
🧠 **Weighting: 50% of A-Level**
📝 **Format: Mixture of short and extended answer questions, including maths and product analysis**

💡 High-Scoring Student Habits

- ✅ Link every decision back to user needs or specification
- ✅ Use technical terminology
- ✅ Use intuition when they know nothing
- ✅ Include justified trade-offs
- ✅ Evaluate honestly — flaws and improvements

Disclaimer:
This guide is based on my personal understanding, experience, and interpretation of the Edexcel A-Level Design & Technology specification. It is not affiliated with or endorsed by Pearson Edexcel. Students should always refer to the official specification, mark schemes, and guidance provided by their teachers or exam board for the most accurate and up-to-date information.

Question 1)

Figure 2 shows a sink plug.

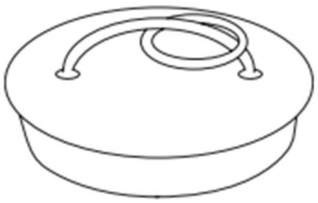


Figure 2

The sink plug is made out of rubber.

Explain **one** reason why rubber is a suitable material for the sink plug.

(3)

*Notice that the question wants 3 marks for one-point, unique answer structure is required

Mark structure:

1. **State the relevant property or feature**
- Rubber is chemically resistant (1)
2. **Give a reason or describe how this property works**
- It will not degrade when exposed to soaps etc
3. **Link it back to the question**
- Meaning in can be used in a domestic environment

Example answer)

Rubber is flexible (1), **this means that** it can be squashed (1), **so** when it is placed in the plughole it will provide a watertight seal (1).

Question 2)

3 Figure 4 shows a fizzy drinks bottle manufactured from polyethylene terephthalate (PET).

Figure 4

(c) Explain **two** reasons why blow moulding has been used for the production of the bottle.

(6)

*Notice that the question wants 6 marks for two points, use the same structure as the question above

Mark structure:

1. **State the relevant property or feature**
- Reusable mould (1)
2. **Give a reason or describe how this property works**
- reduces the overheads of bottle production (1)
3. **Link it back to the question**
- allowing the bottle to manufactured cost effectively (1)

Example Answer)

Blow moulding is a rapid industrial process (1) **because** it utilises automated machinery (1), **this means that** it can operate continuously potentially increasing profits (1).

Blow moulding uses a reusable mould (1) **which leads to** a reduction in overhead costs, **which means that** the bottle can be manufactured cost effectively and at a low unit cost (1).

Question 3)

(b) Manufacturers need to undertake financial forecasts which include the preparation of budgets.

Outline considerations that need to be taken into account when preparing budgets.

(6)

*** Command word 'Outline' means we can use a list answer, no need to explain your points. Personally, I don't like to use bullet point here but it would probably be fine.**

Mark structure:

- **x6 Points relevant to the question**

Example Answer)

Set-up costs (1)

Material costs (1)

Labour costs (1)

Transportation costs (1)

Training and development costs (1)

Manufacturing cost (1)

Question 4)

(b) Figure 1 shows an image of some disposable cutlery manufactured from polystyrene.

Looks shiny -> smooth and self-finishing -> easily mass produced (1).

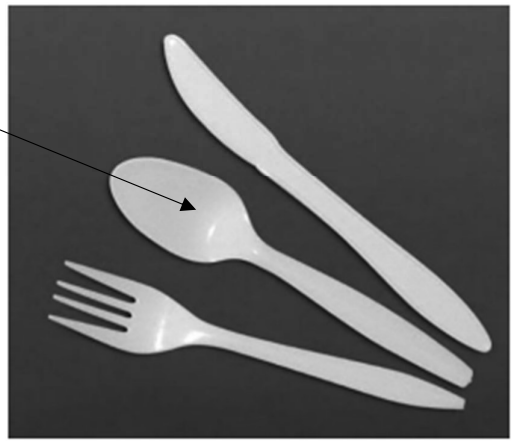


Figure 1

Polystyrene was selected for the disposable cutlery as it is lightweight and available in a range of colours.

State **six** further characteristics of polystyrene that make it a suitable material for disposable cutlery.

(6)

***What I like to call an intuition test, even if you know nothing about Polystyrene you should be able to 'guess' your way to full marks**

Mark structure:

- **x6 Points relevant to the question**
- **They've given you an image, look at it, what can you take from it? Are there any clues as to what be on the mark scheme?**

Example answer)

Tough (1)

Easily mass produced (1)

Chemical resistant (1)

Non-toxic (1)

Heat resistant to food temperatures (1)

Smooth surface finish (1)

Question 5)

(b) Describe, using annotated sketches, the process of printing using flexography.

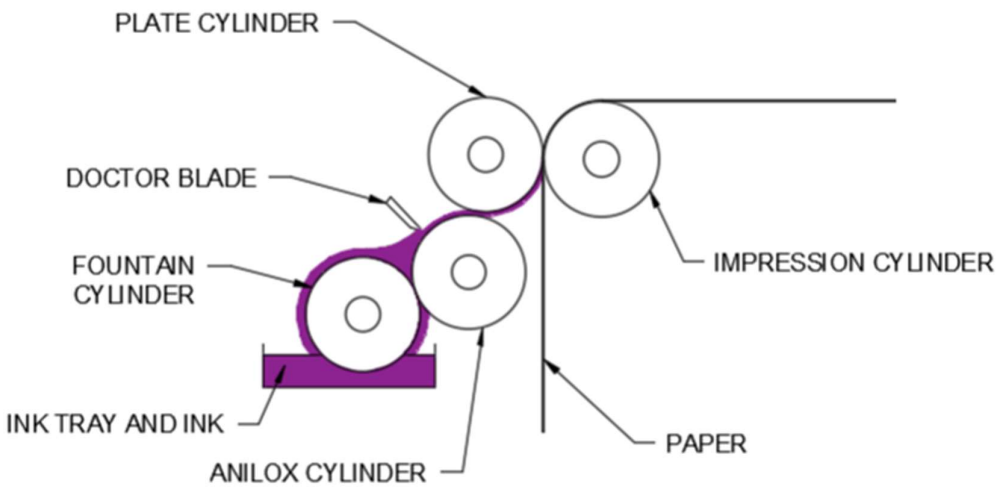
(4)

***The very standard 'Section 3.1' question that you can expect on every exam, a neat 2D drawing here with some annotation/notes will score you full marks.**

Mark structure:

- **A neat 2D diagram**
- **Annotations**
- **x4 points about process**

Example answer)



1. Ink pan/fountain sources ink for fountain roller/cylinder (1)
2. Ink transferred to the plate cylinder using rollers (1)
3. Doctor blade removes excessive ink (1)
4. Ink is transferred to the media by pressure applied by the impression cylinder/roller (1)

(+2) for sketch

Question 6)

***The very standard 'Section 5.4' question that you can expect on every exam, very revisable as all 5.4 topics have been tested in the past (i.e. a memory test / how well you revised).**

8 Figure 10 shows an office building designed and constructed during the Art Deco period.

Figure 10

Discuss how the design of the office building was influenced by Art Deco philosophies.

(9)

Mark structure:

- **x9 Points relevant to the question**
- **They've given you an image, look at it, what can you take from it? Are there any clues as to what be on the mark scheme?**
- **Remember to mention 'marks' that have nothing to do with the photo (e.g. emerged from France in 1920s)**

Example answer)

Art deco has influenced the building in many ways (Intro – no marks). One way is through the use of polished stone; this opulent style was a reaction against post war austerity and was often referred to as 'Hollywood style'.

Originating from France in the 1920s, this ocean linear aesthetic made use of lots of vertical lines and symmetry / geometric forms as shown in the image. It made use of bright and pastel colours, also shown by the image.

The style also took great influence from historic events; the discovery of Tutankhamun's tomb influenced the design style and more generally so did Egyptian and Aztec art / architecture. Man-made materials where exemplified in this design and sunburst motifs where also common to exemplify a 'new dawn' after the end of WW1. (Level 3 answer)

Question 7)

8 Figure 11 shows the interior of the electric car.

(Source: © Sergey Kohl/Shutterstock)

Figure 11

The interior has been designed with ergonomics as a key priority.

Evaluate the ergonomics of the interior with reference to aesthetics and user needs.

(12)

***Usually the final paper in the exam. Marked on a level base system where the top level (level 4) score 10 – 12 marks.**

Mark structure:

- **x12 Points relevant to the question (if you can)**
- **They've given you an image, look at it, what can you take from it? Are there any clues as to what be on the mark scheme?**
- **Try to focus on 3 specific sections of the car (e.g. steering wheel, dashboard, seat ergonomics)**
- **Evaluate (e.g. don't forget the negatives)**
- **Small conclusion**

Example answer)

The steering wheel is located at a suitable distance from the driver and is likely adjustable in height and position to suit the user. The steering wheel has been designed with user needs in mind, likely making use of lots of anthropometric data to ensure the steering wheel is comfortable and ergonomic to hold. The use of textured rubber on the steering wheel also

means it is easy to hold further improving comfort for the driver. The buttons on the steering wheel are in suitable places near where your hands would be when holding the steering wheel. The design of the steering wheel is also quite stylish and ‘premium’.

The dashboard is centred in the middle of the car which allows both the driver and the passenger to interact with it. However, you can see the dashboard is angled slightly towards the driver, which improves visibility and reduces the need for excessive head or body movement, supporting a driver-focused environment. The satnav/infotainment screen is positioned at a high and central level on the dashboard, placing it within the driver's natural line of sight. This reduces eye strain and helps maintain attention on the road. The screen is also angled to avoid glare, improving usability in various lighting conditions. In terms of aesthetics, the dashboard materials, contours, and control shapes contribute to a futuristic and luxurious appearance. However, some users may find that there are too many buttons / is too much information being presented whilst driving which could be off-putting or potentially dangerous for the user.

The seat height and adjustability are also important. In well-designed car interiors like this, the seat can typically be adjusted for height, recline, and back support. These adjustments allow the car to accommodate a wide range of human body types using anthropometric data, ensuring both comfort and control. The armrest is placed at an optimal height relative to the gear selector. This allows the driver’s forearm to rest naturally while operating secondary controls, reducing muscle strain and increasing ease of use. The armrest is likely padded for additional comfort and may include integrated storage improving accessibility to personal items. Aesthetically, both the seat and armrest feature stitched leather or premium materials, contributing to a sense of quality and style.

In conclusion, the dashboard controls, seat, and armrest are all designed with a strong ergonomic focus, enhancing comfort, accessibility, and safety while maintaining a sleek, modern aesthetic. A minor drawback is the large number of buttons, which could overwhelm some users or distract from driving. (Level 4)

Question 1)

Question number	Answer Additional guidance	Mark
1(c)	Any explanation that includes the identification of a correct reason (1) and linked justifications of that reason (1+1): 1. Rubber is airtight / waterproof / can be compressed (especially in hot water) (1) and is flexible / will squash / expand into / grip the plug hole (1) providing a watertight seal / preventing water loss (1) 2. Rubber is a renewable material (1) because it can be harvested continuously without damaging the tree (1) so does not deplete natural resources (1) 3. Chemical resistant to soaps and detergents (1) so can be used in a domestic environment (1) without degrading / lasts a long time (1)	**(3)**

Question 2)

Question number	Answer	Additional guidance	Mark
3(c)	Any two explanations that include identification of a benefit (1) and linked justifications of that benefit (1) + (1). 1. Blow moulding is a rapid industrial process (1) because it utilises automated machinery (1) that can operate on a continuous cycle / increasing potential profits (1) 2. Blow moulding produces minimal waste (1) resulting in reduced landfill (1) therefore reducing environmental impacts (1) 3. Uniform wall thickness / consistent finish (1) because the polymer is in a fluid state (1) allowing air pressure to evenly distribute the polymer within the mould (1) 4. Addition of screw thread is incorporated into the process (1) meaning that secondary processes are not required (1) saving production costs / time (1) 5. Blow moulding produces a seamless bottle / one piece product / hollow product (1) eliminating a potential area of weakness (1) reducing the chance of the bottle failing in use / leaking (1) 6. There is a high demand for drinks bottles / large quantities need to be produced (1) which can be achieved cost effectively with blow moulding (1) because of economies of scale (1) 7. Reusable mould (1) reduces the overheads of bottle production (1) allowing the bottle to manufactured cost effectively (1)	Do not accept repeated justification. Allow mix and match of appropriate identifications and justifications.	**(6)**

Question 3)

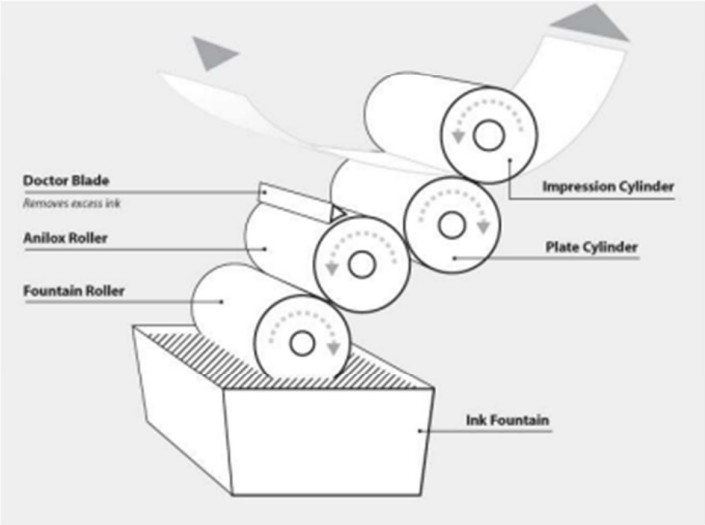
Question number	Answer	Mark
4(b)	An outline covering any 6 of the following points: 1. Set-up costs (1) 2. Material costs (1) 3. Labour costs (1) 4. Transportation costs (1) 5. Training and development costs (1) 6. Manufacturing costs (1) 7. Overhead costs / facilities costs (1) 8. Sales and marketing costs /market research (1) 9. Production capacity (1) 10. Market trends (1) 11. Break even output (1) 12. Product retail price / affordability (1) 13. Quality (1) 14. Market demand / expected production output (1) 15. Storage costs (1) 16. Packaging costs (1) 17. Energy costs (1) 18. Inflation impacting on costs (1) 19. Profit forecasts and requirements (1) 20. Government policies (1) 21. Long term aims and objectives (1) 22. Contingencies / allowance for unexpected events (1)	**(6)**

Question 4)

Polymers Question

- Tough (1)
- Easily mass produced (1)
- Inexpensive polymer (1)
- Chemical resistant (1)
- Non-toxic (1)
- Heat resistant to food temperatures (1)
- Recyclable (1)
- Thermal insulator (1)
- Smooth surface finish (1)

Question 5)

Question number	Answer	Mark
3(b)	Award marks as follows (maximum 4 marks): 1. Diagram showing 4 rollers with media in the correct position (1) 2. Correctly labelling all 4 cylinders in the correct order (1) 3. Ink pan/fountain sources ink for fountain roller/cylinder (1) 4. Ink transferred to the plate cylinder using rollers (1) 5. Doctor blade removes excessive ink (1) 6. Ink is transferred to the media by pressure applied by the impression cylinder/roller (1)  If no sketch, or a sketch without labels, award a maximum of 2 marks.	**(4)**

Question 6)

Question number	Indicative Content	Mark
8	This question is about how the designer of the Office building was influenced by Art Deco philosophies. Creditworthy responses will make connections, which show understanding of factors that need to be considered, going beyond general observation of the image provided. Candidates should consider the design of the building, showing understanding of the influence of Art Deco philosophy. Candidates might refer to the following in their responses: 1. Art Deco emerged from France in the 1920s 2. Eclectic yet elegant style that drew on tradition yet simultaneously celebrated the mechanised modern world 3. Opulent style a reaction to the forced austerity of the First World War 4. Often referred to as 'Hollywood' style 5. Ocean liner aesthetics 6. Use of geometric forms and patterns 7. Vertical lines, symmetry and repetition 8. Expensive materials eg polished stone 9. Use of bright and pastel colours for features, window and door frames 10. Use of white / cream / pale colours for the 'exterior envelope' of the building 11. Use of geometric fan motifs / sunburst motifs 12. Simplified sculptural forms of African, Egyptian and Aztec art and architecture 13. Influences from Tutankhamun's tomb 14. Explicit use of man-made materials 15. Architecture that celebrated man's technological achievements in building skyscrapers and ocean liners Note the response should relate to architecture and influences on the given office building and not general consumer products	(9)

Level	Mark	Descriptor
	0	No rewardable materials
Level 1	1 – 3	• Superficial discussion that considers a narrow range of factors, demonstrating limited understanding. • Partial application of understanding to the context of the question.
Level 2	4 – 6	• Coherent discussion that makes some relevant links between a sufficient range of factors, demonstrating competent understanding. • Generally sound application of understanding to the context of the question.
Level 3	7 - 9	• Comprehensive discussion that makes effective links between a wide range of factors, demonstrating thorough understanding. • Considered and effective application of understanding to the context of the question.

Q7)

Question number	Answer	Mark
8	This question asks candidates to evaluate the decision to use driving ergonomics as a key priority when designing the interior of the car shown in the image. Candidates should analyse the car cockpit in terms of ergonomic design and ease of use and give reasoned justification to qualify their judgements and conclusion. Points of analysis: • Orientation of dashboard towards the driver • Position, size and level of satnav / infotainment screen • Instrument binnacle relative to steering wheel position and shape • Height of dashboard • Shape, size, rim thickness and ergonomic design of steering wheel • Steering wheel based/positioned controls • Position and shape of other controls and minor switchgear • Position and shape of ventilation inlets/controls • Position, shape and presentation of door handle/grab • Position and shape of arm rests • Aesthetic points related to the above Points of evaluation: • Driver focused environment • Holistic ergonomics of the whole cockpit / driving environment • Ergonomics at a micro level • Range of human movement • Use of anthropometrics • Safety • Comfort • Access • Aesthetic evaluation • Appropriate conclusion	**(12)**

Level	Mark	Descriptor
	0	No rewardable materials
Level 1	1 – 3	• Applies a basic understanding to deconstruct information, making limited connections between concepts. • Incomplete evaluation with unresolved conclusion that demonstrates limited synthesis of understanding. • Judgements are tentatively supported by evidence. • The candidate demonstrates a limited understanding of ergonomic design within the context of the question
Level 2	4 – 6	• Applies a generally sound understanding to deconstruct information and provide some clear connections between concepts. • Imbalanced evaluation that synthesises some relevant understanding into a generally coherent conclusion. • Judgements are occasionally supported by relevant evidence. • The candidate demonstrates a basic understanding of ergonomic design within the context of the question
Level 3	7 - 9	• Applies an effective understanding to deconstruct information and provide logical connections between concepts. • Balanced evaluation that synthesises relevant understanding into a considered conclusion. • Judgements are mostly supported by relevant evidence. • The candidate demonstrates a good understanding of ergonomic design within the context of the question
Level 4	10 - 12	• Applies a comprehensive understanding to deconstruct information and provides insightful connections between concepts throughout. • Thorough and balanced evaluation that synthesises relevant understanding into a well-developed conclusion. • Judgements are supported by pertinent evidence throughout. • The candidate demonstrates a developed understanding of ergonomic design within the context of the question