



GCE A LEVEL MARKING SCHEME

AUTUMN 2020

**A LEVEL
DESIGN AND TECHNOLOGY – PRODUCT DESIGN
A602U10-1**

INTRODUCTION

This marking scheme was used by WJEC for the 2020 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

GCE A LEVEL DESIGN AND TECHNOLOGY
AUTUMN 2020 MARK SCHEME
COMPONENT 1 - PRODUCT DESIGN

Question 1

Materials can broadly be classified into groups.

- (a) Provide a definition of **each** of the three material classification groups given below: [3]
- i. Synthetic
 - ii. Natural
 - iii. Regenerated
- (b) The image shown below is of a car body made from GRP (Glass Reinforced Plastic). Describe the stages of laminating a GRP product by hand. [6]
- (c) The bicycle wheel and water bottle shown below are made from anodised aluminium. Explain what is meant by 'anodising'. [2]
- (d) Describe in detail **four** benefits of anodising as a finish for aluminium. [4]

Q1	Science	Maths		AO3		AO4					Total
				2a	2b	1a	1b	1c			
(a)	✓					3					3

Candidates should demonstrate knowledge and be awarded 1 mark for each correct definition:

Synthetic

'Synthetic materials are made from chemicals.' [1]

Natural

'Obtained or made from living things.' [1]

Regenerated

'Made from another raw material in a state that needs bonding, or a waste product/or recycled' [1]

Credit any other appropriate response.

(b)	✓						6				6
Candidates should demonstrate understanding and be awarded up to 6 marks. Stages will include: 1. Coat the mould with a releasing agent. [1] 2. Apply gel-coat to the mould with a brush. [1] 3. Cut glass fibre matt into pieces to allow for laying-up. Mix the resin and catalyst. [1] 4. After gel-coat has cured coat mould with catalysed resin and lay-up first layer of glass matt fibre. Stipple matt using brush so ensure matt is saturated and all air is forced out. [1] 5. Repeat with successive layers of matt and resin, edges can be trimmed with sharp scissors or knife. [1] 6. After resin has fully cured, remove from mould. [1] Award one mark for correct identification of each stage. Do not credit a response that is not in the correct order. Health and safety considerations on their own do not get credit. <i>Credit any other appropriate response.</i>											
(c)	✓						2				2
Candidates should demonstrate knowledge and be awarded 2 marks for: Anodising is an electrolytic process for producing thick oxide coatings on aluminium and its alloys. [1] Oxidation occurs at the component surface, resulting in the formation of a coherent oxide film that is very adherent to the underlying metal substrate and accepts dyes. [1] <i>Credit any other appropriate response.</i>											
(d)							4				4
Candidates should demonstrate understanding and be awarded up to 4 marks based on the benefit of anodising, such as: Aluminium's natural barriers are enhanced which increases the durability and corrosion resistance. [1] Colour dyes can be added to enhance the aesthetic appeal of the product. [1] The process has optimal surface coverage which gives a good quality of colour across the whole surface. [1] Very good abrasion resistance which improves the wear and tear over time [1] Anodising provides additional strength enhancing the life of the product. [1] <i>Credit any other appropriate response.</i>											

Question 2

Charts like the one shown below are often used to help manage complex projects.

- (a) Name the type of chart shown above, then compare and contrast the features of this project management system with a flowchart. [5]
- (b) The chart above includes a critical path. Explain the purpose of a critical path. [2]

Q2	Science	Maths		AO3		AO4					Total
				2a	2b	1a	1b	1c	2a	2b	
(a)						1				4	5

Candidates should demonstrate knowledge and be awarded 1 mark.

Gantt Chart 1 mark

Candidates should demonstrate understanding and be awarded up to 4 marks based on an features of each management system and comparison between the two:

Gantt Chart

Gives project overview with start and finish date.

Shows overlapping tasks to allow for resource allocation.

Identifies how long each activity will last.

Allows the project manager to organise tasks in the most efficient way to reduce wasted time.

Shows dependent activities and can be used to check whether a project is on track.

Better for larger more complex projects.

Flowchart

Flowchart is a schematic representation of a process.

Shows a process 'flow' through block diagrams.

Shows inputs and outputs to a process.

Shows feedback loops.

Ability to show QC checks and decision points.

Better for short term and smaller projects.

One mark for each comparison and or contrast feature.

Example

A Gantt chart gives a project overview with start and finish date whereas a flowchart is just a schematic representation of the process. [1]

Credit any other appropriate response.

(b)						2					2
Candidates should demonstrate knowledge and be awarded up to 2 marks based on the description of the critical path in a Gantt chart. The “critical path” in a Gantt chart refers to the longest sequence of dependent or floating tasks that must be completed in order to get the project done on time. [1] This longest sequence of dependent activities is the shortest time in which a project can be completed. [1] <i>Credit any other appropriate response.</i>											

Question 3

A patent is an example of intellectual property protection. Analyse and describe, using examples, the conditions that must be met if a creation is to be patented. [6]

Q3	Science	Maths		AO3		AO4					Total
				2a	2b	1a	1b	1c	2a	2b	
				3						3	6

Candidates demonstrate knowledge and are awarded up to 6 marks.
Award marks for:

A creation is only patentable if it is:

- New and previously undisclosed [1] Work discussed with other parties cannot be patented as proving origination can be difficult [1]
- Distinguished by an inventive next step [1] such as the cyclone technology used in Dyson vacuum cleaners. A next step that is obvious to those that work in the same sector cannot be patented [1]
- Capable of industrial application [1], i.e. that it is capable of being made through processes such as (but not limited to) injection moulding, deep drawing, laser cutting etc. [1]

Credit any other appropriate response.

Band	Marks	AO3 2a	Marks	AO4 2b
3	3	Excellent analysis of the conditions required for a Patent to be granted. A thorough discussion, which deconstructs information and demonstrates logical connections and reasoning throughout. Well-considered, relevant factors used as a context for the discussion	3	Demonstrates and applies a thorough knowledge and understanding of conditions for a Patent.
		There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.		
2	2	Good analysis of the conditions required for a Patent to be granted. A generally sound discussion, which deconstructs information and provides adequate connections and reasoning. Generally well-considered and relevant factors used as a context for the discussion	2	Demonstrates and applies a generally sound knowledge and understanding of conditions for a Patent.
		There is a line of reasoning which is generally coherent, mainly relevant and with some evidence and structure.		
1	1	Limited analysis of the conditions required for a Patent to be granted. Little evidence of deconstructing information and limited connections are made. Few factors are identified.	1	Demonstrates and applies a basic knowledge and understanding of conditions for a Patent.
		There is limited evidence of relevant examples or structure.		
	0	No response or work that is worthy of a mark		

Question 4

- (a) The bottom shelf is 1200mm long. The shelves above decrease in length by 10% at **each** height. Calculate the length of each shelf to the nearest mm. [4]

Show all calculations.

- (b) The shelves are 365mm wide. The natural wood planks used to make them are supplied in planks measuring 144mm wide which require edge gluing to make up to 365mm. Calculate how many linear metres of wood planks would be needed to make all of the shelves. [3]

Show all calculations.

- (c) The top shelf is 200mm from the top of the triangular frame. Each shelf is 18mm thick and evenly spaced. Calculate the space between each shelf to the nearest mm. [2]

Show all calculations.

- (d) Calculate the missing dimensions of the triangular frame identified as 'a' and 'b'. [4]

Show all calculations.

- (e) The student has decided to increase the overall size of the product. The new bottom shelf will measure 1500mm. If the size ratio remains the same, calculate the new height of the shelving unit to the nearest mm. [2]

Show all calculations.

Q4	Science	Maths		AO3		AO4				Total
				2a	2b	1a	1b	1c		
(a)		2						4		4

Bottom shelf = 1200mm

Shelf 2

$$1200 / 100 \times 10 = 120$$

$$1200 - 120 = 1080\text{mm}$$

$$\text{Shelf 2} = 1080\text{mm}$$

[1 mark]

Shelf 3

$$1080 / 100 \times 10 = 108$$

$$1080 - 108 = 972$$

$$\text{Shelf 3} = 972\text{mm}$$

[1 mark]

Shelf 4

$$972 / 100 \times 10 = 97.2$$

$$972 - 97.2 = 874.8$$

$$\text{Shelf 4} = 875\text{mm}$$

[1 mark]

Shelf 5

$$874.8 / 100 \times 10 = 87.48$$

$$874.8 - 87.48 = 787.32$$

Shelf 5 (top shelf) is 787mm long.

[1 mark]

Do not penalise for any errors carried forward, continue to award marks if you can clearly see the mathematical method used by the candidate.

Credit any other appropriate response.

(b)		3						3			3
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Stage 1

Add linear lengths of shelves (mm)

$$1200 + 1080 + 972 + 874.8 + 787.32 = 4914.12\text{mm}$$

[1 mark]

Stage 2

Work out how many 144mm planks needed per metre of shelf

$$365 / 144 = 2.53 \text{ plank widths}$$

3 metres per 1 metre shelf

[1 mark]

Stage 3

4914.12 mm of shelves (5 metres)

3 metres per 1 metre side on

$$5 \times 3 = 15 \text{ metres of wood, (15000mm)}$$

[1 mark]

Do not penalise for any errors carried forward, continue to award marks if you can clearly see the mathematical method used by the candidate.

Credit any other appropriate response.

(c)		2						2			2
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$$1500 - 200 = 1300 \text{ (space between bottom of bottom shelf and top of top shelf)}$$

$$5 \text{ shelves at } 18 \text{ mm thick } 5 \times 18 = 90$$

[1 mark]

$$1300 - 90 = 1210$$

$$1210 - 4 = 302.5$$

Answer = 303mm

[1 mark]

Do not penalise for any errors carried forward, continue to award marks if you can clearly see the mathematical method used by the candidate.

Credit any other appropriate response.

(d)		4						4			4
Calculation of side 'a' Tan (22) = $\frac{\text{opp}}{\text{Adj}}$ [1 mark] $a = 1500 \times \tan(22) = 606.04$ answer is side 'a' = 606mm [1 mark] Calculation of side 'b' $a^2 + c^2 = b^2$ $(a)^2 + (c)^2 = (b)^2$ [1 mark] $2250000 + 367236 = (b)^2$ $2617236 = (b)^2$ $\sqrt{2617236} = \sqrt{b^2}$ $b = 1617.79$ Answer is side 'b' = 1618mm [1 mark] Do not penalise for any errors carried forward, continue to award marks if you can clearly see the mathematical method used by the candidate. <i>Credit any other appropriate response.</i>											
(e)		2						2			2
New width = 1500mm Old width = 1200mm $1500 - 1200\text{mm} = 300\text{mm}$ 300 is 25% of 1200 [1 mark] $1500 \times 1.25 = 1875\text{mm}$ New height = 1875mm [1 mark] Do not penalise for any errors carried forward, Continue to award marks if you can clearly see the mathematical method used by the candidate. <i>Credit any other appropriate response.</i>											

Question 5

Promotion is one of the 4 Ps of the marketing mix.

(a) Identify the other three Ps. [3]

(b) Discuss the various methods that can be used to promote products. [6]

Q5	Science	Maths		AO3		AO4					Total
				2a	2b	1a	1b	1c			
(a)						3					3

Candidates should demonstrate knowledge and be awarded 1 mark for each of the following.

- Price [1]
- Place [1]
- Product [1]

Credit any other appropriate response.

(b)								6			6
Candidates should demonstrate and apply knowledge and understanding and are awarded up to 6 marks. • Coupons or money-off pull strategies (e.g. BOGOF). Consumers respond to promotions that give them more product for their money. These are effective as they are available at the point of purchase and so persuade the consumer to 'switch' brands even if it only for a short time, increasing market share (thus reducing that of your competitors) • Traditional sponsorship deals or endorsements, for example of local sports teams, celebrities etc. Allows for promotion at a local level and shows that the brand/product is invested in the local area building brand loyalty. • Television and radio advertising. Expensive and wide reaching. Television and radio adverts can be costly to produce but reach a wide audience. When TV choice was more limited (i.e. 4 or 5 channels) the audience was much larger for each program but there was arguably more waste as not all consumers would be active. Now with an increased range of channels, demographic may be more focussed, but this is offset by the fact that consumers are in control i.e. they record and watch when they want to and can skip past the adverts • Publicity via written media e.g. press release editorials. This can often give a brand or product extra credentials as it can be or appear to be written by a third party and so consumers are more likely to trust and believe in the advertising method. • Trade fairs and exhibitions, very focussed target market. Visitors to such events are likely to be more motivated to buy and will be active in the market. • Modern sponsorship deals or endorsements via social media such as Instagram, Twitter or Facebook. This helps reach a younger audience and can penetrate a market much quicker than traditional promotion methods. • On-line advertising including pop-ups, promotion often relies on repetition of message and pop-up advertising via the internet allows for increased frequency so adverts views at a relatively low cost leading to higher target market recall. • On-line personal advertising banners tailored according to your personal digital footprint. This allows for personalised advertising which promotes products that are of specific interest to the potential consumer. This has the potential to lead to increased sales and attracts advertisers as most of the advertising budget is being targeted at those who might be actively looking for that product or one similar. <i>Credit any other appropriate response.</i>											

Question 6

- (a) Identify and describe **each** of the steps in a 5-stage risk assessment. [5]
- (b) Describe and justify four ways in which risks can be reduced when using a pillar drill. [4]

Q6	Science	Maths		AO3		AO4				Total
				2a	2b	1a	1b	1c		
(a)								5		5

Candidates should demonstrate knowledge and are awarded up to 5 marks. One mark for each correct stage of the risk assessment.

1. Look for the hazard - hazards being anything that can cause harm. [1]
2. Decide who/what may be harmed and how. [1]
3. Evaluate the risks and decide whether existing precautions are adequate or whether more needs to be done. Risk is the chance, high or low, that someone will be harmed by the hazard. [1]
4. Record the findings. – to record and consider changes to reduce future risks [1]
5. Review the assessments and revise if necessary, over a set period of time. [1]

(b)									4	4
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Candidate should demonstrate that understanding and application of knowledge and are awarded up to 4 marks.

Do not award marks if the candidate has only identified risk or control measure, both must be discussed/justified.

- Goggles can be worn to protect against dust and flying objects. [1]
- Long hair tied back and loose clothing secured to avoid entanglement [1]
- Dangling jewellery to be removed and gloves or bandages should not be worn to avoid entanglement [1]
- Check that the chuck key has been removed prior to starting the machine and after the work is completed. If it is left in it will be ejected when the machine starts. [1]
- Work pieces should be clamped and secure when the machine is operating to avoid work 'spinning out'. [1]
- Appropriate safety zone should be in operation to avoid third parties accidentally pushing the user operating the machine causing harm by entanglement [1]
- Suitable footwear should be worn to protect the operator from falling work pieces and to make sure that they do not slip while using the machine. [1]
- Swarf must be removed using a tool to avoid cutting the operators hand. [1]
- All users should be safety certificated to avoid an accident by misuse. [1]

Credit any other appropriate response.

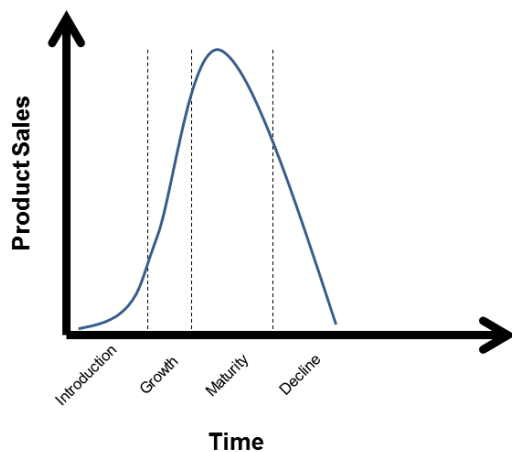
Question 7

Fad products, such as the products shown below have a short Product Life Cycle.

- (a) Draw and label a typical the life cycle chart for a fad product. [4]
- (b) Evaluate the ways in which designers can increase the time at which a product is at peak sales. [5]

Q7	Science	Maths		AO3		AO4					Total
				2a	2b	1a	1c	2a	2b	2c	
(a)						4					4

One mark should be awarded for each correctly identified drawn and labelled phase of the life cycle



Do not accept a response that shows a graph with an extended period of time at the 'maturity' stage.

Credit any other appropriate response.

(b)					5					5
Candidates should show clear evidence of appraisal and/or <u>making judgements</u> and <u>applying</u> this to technical principles to be awarded up to 5 marks. Award a maximum of two marks per evaluated point up to a maximum of 5 marks • Decrease price so that the product is within the price range of a new market segment one that would otherwise have been excluded. [1], This, however, could reduce product profitability and perceived quality of the product [1] • Increase new product range or special edition. Adding new features can encourage extra sales. [1] As an example, loom bands increased their range of colours, sparkle finishes and shapes of rubber band which encouraged additional sales. Adding an extra range or special edition can increase product production costs and risks over production if the uptake is not accurately assessed. [1] • New innovations to the existing product range. [1] Updating and refreshing an existing product can encourage loyal customers to purchase again. An established customer base is already established making uptake more likely. [1] • Increase advertising. [1] New market segments may become aware of the product and be motivated to purchase. A range of promotion strategies can be used. [1] • Introduce a follow-up product, one that is considered to be an add-on for the existing product. [1] This keeps the product competitive and adds extra value for consumers. [1] • Bundling products together is a good way to make customers feel like they are getting a better offer, encouraging more of them to purchase [1]. It is likely to run down any extra left-over stock from over production. [1] <i>Credit any other appropriate response.</i>										

Question 8

Some manufacturers are using wind power as the main power source to power their factories. Analyse the benefits and limitations of wind power sources for manufacturing. [9]

Q 8	Science	Maths		AO3		AO4				Total
				2a	2b	2a	2b	2c		
				6				3		9

Candidates should provide evidence of logical reasoning or deconstructing information and applying this to be awarded up to 9 marks. Focus should be on the analysis of the factors, though candidates are expected to apply knowledge and understanding.

Benefits and limitations must be discussed for the candidate to be awarded 9 marks.

Benefits

- Cost effective energy source. As wind turbines rely on simple mechanical processes, once the turbines are installed then the running costs are low compared with fossil fuels.
- Any excess power created can be sold back to the energy companies, which is not possible with traditional power sources.
- Energy generated by wind does not emit CO₂ or leave any waste material that has to be disposed of or processed.
- Renewable power source that reduces the reliance on fossil fuels.
- Companies will be able to talk about their 'green credentials' in marketing and PR campaigns, this will give them a competitive edge over their rivals.
- Offers price stability, fossil fuels are more susceptible to price rises and changes in the economic outlook of a country whereas wind energy costs are more predictable allowing companies to better predict overheads.
- Wind is a domestic energy source and so does not need to be imported from other countries, therefore companies do not need to pay extra tariffs. Often oil and gas supplies are imported from other countries to meet domestic demand.

Limitations

- Wind turbines require planning permission and may people believe them to be a blot on the landscape so local population may not want the turbines in the area.
- Initial set-up costs are high which might prohibit initial investment.
- The amount of energy produced depends on wind speed and length of time the wind can turn the turbine, so it is unpredictable, therefore output is less reliable than traditional power sources.
- The wind turbines could damage habitats of local wildlife and cause noise pollution.

Credit any other appropriate response.

Band	Marks	AO3 2a	Marks	AO4 2c
3	5-6	Excellent analysis of the wind energy benefits and limitations for factory power source. A thorough discussion, which deconstructs information and demonstrates logical connections and reasoning throughout. Well-considered, relevant functional factors and environmental factors used as a context for the discussion	3	Applies a thorough knowledge and understanding of range of factors affecting wind energy as a power source, with well considered relevant functional factors and environmental factors identified.
		There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.		
2	3-4	Good analysis of the wind energy benefits and limitations for factory power source. A generally sound discussion, which deconstructs information and provides adequate connections and reasoning. Generally well-considered and relevant factors used as a context for the discussion	2	Applies a generally sound knowledge and understanding of range of factors affecting wind energy as a power source, with well-considered relevant functional factors and environmental factors identified.
		There is a line of reasoning which is generally coherent, mainly relevant and with some evidence and structure.		
1	1-2	Limited analysis of wind energy benefits and limitations for factory power source. Little evidence of deconstructing information and limited connections are made. Few factors are identified.	1	Applies a basic knowledge and understanding of wind energy as a power source for powering a factory.
		There is limited evidence of relevant examples or structure.		
	0	No response or work that is worthy of a mark		

Question 9

Designers use a range of strategies to encourage creative outcomes. Two of these are morphological analysis and brainstorming. Explain how these strategies promote creativity in the design process. [9]

Q9	Science	Maths		AO3		AO4					Total
				2a	2b	1a	1b	1c	2b	2c	
							5		4		9

Candidates should demonstrate knowledge and understanding of technical principles and design and making principles and apply this to be awarded up to 9 marks based on:

Morphological analysis

- Morphological analysis is visually recorded in a 'morphological chart'. Allowing designers to 'see' all of the possibilities.
- The method encourages designers to explore all of the possible solutions to a multi-dimensional problem in a structured way. This helps stop 'fixation'.
- It is used when exploring new and different ideas by splitting it down into parts, allowing designers to focus on a range of solutions for a focussed part of the problem without having to tackle the whole problem in one go. This allows creative solutions to component parts of a solution as well as the solution as a whole.
- As a result all aspects of a problem are thoroughly investigated
- Relatively simple technique that be carried out as an individual or as part of a group design activity
- Morphological analysis requires the following steps that break the task down into manageable steps making sure that the analysis is full and detailed:
 1. Problem description - what the problem is
 2. Identify components - what is important for solving the problem
 3. Properties - looking at as many features as possible for the different components
 4. Combining - making arbitrary combinations, there will be many possible solutions
 5. Evaluation – possible solutions will be evaluated for feasibility and suitability
 6. Implementation – solution chosen and developed/implemented

Brainstorming

- Can be carried out a group activity and so can harness collective creative thought and ability
- Remove inhibitions and barriers that could stop free-flowing creative thought. All participants can contribute in a 'safe' creative environment.
- Designers are encouraged not to 'police' their own ideas or judge those of others and so it is a 'safe' task where everyone can contribute without feeling judges. All ideas are welcome no matter how bizarre they might first appear.
- Contributions are made as ideas and suggestions form which allows free-flow of ideas and train-of-thought. Often there is not one 'scribe' but all participants add to a live brainstorming chart so that bottle-necks of ideas don't occur.
- Visual aids and objects can be used to spark off new thought and discussion
- 'Facilitators' can sometimes be used if ideas stop flowing.

Candidates need to demonstrate knowledge and understanding of the processes and explain the impact they have on the creative process.

Credit any other appropriate response.

Band	Marks	AO4 1b and 1c	Marks	AO4 2b and 2c
3	4-5	Demonstrates and applies a thorough knowledge and understanding of technical principles in both processes. Well-considered, relevant wider issues identified.	3-4	Demonstrates and applies a thorough knowledge and understanding of morphological analysis and brainstorming, drawing upon well-considered, relevant examples.
		There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.		
2	2-3	Demonstrates and applies a generally sound knowledge and understanding of technical principles in both processes, relevant issues identified.	2	Demonstrates and applies a generally sound knowledge and understanding of morphological analysis and brainstorming. Generally well-considered examples are provided.
		There is a line of reasoning which is generally coherent, mainly relevant and with some evidence and structure.		
1	1	Demonstrates and applies a basic knowledge and understanding of technical principles to the context of creativity theme. Few issues are identified.	1	Demonstrates and applies a basic knowledge and understanding of designing and making principles in morphological analysis and brainstorming. Few examples are provided.
		There is limited evidence of relevant examples or structure.		
	0	No response or work that is worthy of a mark		

Question 10

Evaluate the impact Product Champions and Entrepreneurs play in the development and delivery of innovative products. [12]

Q 10	Science	Maths		AO3		AO4				Total
				2a	2b	1a	1b	1c		
					6			6		12

Candidates should provide evidence of either appraisal and/or making judgements and applying this to be awarded up to 12 marks based on:

Product Champion

A Product Champion is an individual who has a passion for and belief in a product or concept. They are prepared to 'champion' the product and make sure that their product is at the forefront of the mind of investors, business leaders, financiers, developers and consumers, often even in busy companies or a crowded marketplace.

They will encourage the development of the product to ensure that, at first, it reaches market and then stays there as a market leader. They will encourage the products development over time to encourage new innovations and technical development. They are tasked with ensuring internal (company) development and external promotion.

The Product Champion 'owns' the product vision and employs relevant expertise as required throughout the lifecycle of the product in order to ensure its continued success. Designers, Financial Controllers, Marketers, Brand Managers, R&D teams could all be included in this. It is often the job of the Product Champion to help different areas of a business 'look outside' of their immediate area of responsibility to see how, in their role, they can impact on a products success.

Product Champions are pioneers of new products and are tasked with developing products that are destined to become a success in the marketplace.

Entrepreneur

An Entrepreneur is someone with foresight, drive and ambition to take a risk to solve business or consumer problems. They have the passion and vision to see potential success in ideas and concepts that might be at their very early stages. It is the job of the entrepreneur to persuade others to provide finance for an idea or invention to become and innovation.

Entrepreneurs are always on the look-out for new inventions, ideas or concepts. They often seek inspiration to find better or more efficient ways of doing things to ways to refine, define and develop products. Entrepreneurs tend to be seekers of change – open to new ideas.

An Entrepreneur may be a 'one-man-band', but they build up networks of people they can trust and rely on so that they can tap into the expertise when they need to. They have the ability and foresight to see what will work and can then 'scale-up' to make products a commercial success.

An Entrepreneur will seek to protect their ideas with IP and will ensure that these rights are not infringed

Credit any other appropriate response.

Band	Marks	AO3 2b	Marks	AO4 1c
3	5-6	Excellent evaluation of the role of Product Champions and Entrepreneurs in the innovation of products. A thorough discussion, which appraises and/or makes judgements about each role in the development of products. Well-considered, relevant wider issues used as a context for the discussion.	5-6	Applies a thorough knowledge and understanding of technical principles associated with the roles of Product Champion and Entrepreneur in the development of products. Well-considered, relevant wider issues identified.
		There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.		
2	3-4	Good evaluation of the role of Product Champions and Entrepreneurs in the innovation of products. A generally sound discussion, which appraises and/or makes judgements about each role in the development of products. Generally well-considered, relevant issues used as a context for the discussion.	3-4	Applies a generally sound knowledge and understanding of technical principles associated with the roles of Product Champion and Entrepreneur in the development of products. Generally well-considered, relevant issues identified.
		There is a line of reasoning which is generally coherent, mainly relevant and with some evidence and structure.		
1	1-2	Limited evaluation of the role of Product Champions and Entrepreneurs in the innovation of products. Little evidence of appraising or making judgements about each role in the development of products. Few issues are identified.	1-2	Applies a basic knowledge and understanding of technical principles associated with the roles of Product Champion and Entrepreneur in the development of products.
		There is limited evidence of relevant examples or structure.		
	0	No response or work that is worthy of a mark		