



INSIGHT

Year 12 Trial Exam Paper

2013

Product Design and Technology

Sample responses

This book presents:

- high-level sample responses
- mark allocations
- tips and guidelines

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SECTION A

Question 1a.

Worked solution

Step 2: design brief

Step 9: production

Mark allocation: 1 + 1 = 2 marks

- 1 mark for identifying each correct step

Question 1b.

Worked solution

While writing my production plan, I found that I don't have the right tools/equipment/skills to make my chosen design. I need to do more research to find a solution as to how I can make the product.

Mark allocation: 3 marks

- 1 mark for identifying the correct steps
- 1 mark for identifying a problem with the production plan
- 1 mark for identifying which aspect requires more research

Question 1c.

Worked solution

Visualisations are concept sketches. They are a means for the designer to explore ideas and are rough drawings. Working drawings are technical. They show sizes and construction methods and are neat finished drawings.

Mark allocation: 4 marks

- 1 mark for identifying what a visualisation is
- 1 mark for identifying what a working drawing is
- 2 marks for explaining the difference (1 mark for basic explanation and 2 marks for a more detailed response)

Question 2**Worked solutions**

Sustainability system or model: Extended Producer Responsibility (EPR)

High-range response

Justification: EPR is an approach that recognises companies have a responsibility beyond just the manufacture of the product. The employees' health and safety and the ethics of the subcontractors are also to be considered. The workers outside of the factory system were not working in safe conditions and were experiencing bad health problems as a result. This needed to be fixed. Forward Fashions realised that while ceasing dealings with the subcontractor stopped child labour, it also made those children's lives worse, as they weren't earning money. Forward Fashion helped the families to obtain more highly paid work with better conditions and helped the children to go back to school. This was morally right but not required by law.

Medium-range response

Justification: Companies need to think about the impacts their products have beyond the making. Child labour is bad for the children. Forward Fashion got them back to school.

Low-range response

Justification: Forward Fashion stopped using child labour so they look good.

Mark allocation: 1 + 6 marks = 7 marks

- 1 mark for correctly identifying Extended Producer Responsibility as the sustainability system that best related to Forward Fashion's response
- 1–2 marks for a low-range answer
- 3–4 marks for a medium-range answer
- 5–6 marks for a high-range answer

**Tip**

- *This question is designed to differentiate between students who can stumble onto an answer and those who really know the material. It gives the marker scope to 'reward' students who clearly demonstrate that they understand the content.*

**SECTION A
TURN OVER**

Question 3a.**Worked solution**

	Company factory	Family home
Step 1. Identify hazards	<ul style="list-style-type: none"> • Sharp needles • Poor posture • Low light 	<ul style="list-style-type: none"> • Sharp needles • Poor posture • Low light
Step 2. Assess risks	<ul style="list-style-type: none"> • High • High • Low 	<ul style="list-style-type: none"> • High • High • High
Step 3. Control hazards and risks	<ul style="list-style-type: none"> • Provide gloves for workers • Provide seats and tables to work at the right height – purchase if needed • Make sure the lights are bright enough 	<ul style="list-style-type: none"> • Provide gloves for workers • Provide seats and tables to work at the right height – ask workers to buy if needed • Make sure homes have electricity; if not, workers will need lanterns
Step 4. Check controls	<ul style="list-style-type: none"> • Check the condition of workers' gloves at the end of each week • Ask workers to report back pain Adjust seating heights as needed • Check and replace broken lights each week 	<ul style="list-style-type: none"> • Send someone to check the condition of workers' gloves • Ask workers to report back pain to the person who collects the clothing • Check if electricity is working and if they can afford batteries or fuel for lanterns

Mark allocation: 12 marks

- 4 marks for step 1 (1 mark for each hazard identified, to a maximum of 4 marks). At least one hazard must be identified in each column.
- 2 marks for step 2 (1 mark for each risk-assessment column). At least one assessment must be identified in each column. Must relate to the hazard identified in step 1.
- 4 marks for step 3 (1 mark for each control measure listed, or 2 marks for each control measure given in detail, to a maximum of 4 marks). At least one measure in each column. Must relate to the hazard identified in step 1.
- 2 marks for step 4 (1 mark for each check, to a maximum of 2 marks). At least one check in each area. Must relate to the hazard identified in step 1.

Question 3b.**Worked solution**

Forward Fashion's difficulties would include the fact that this process is handled by a subcontractor and that the workers know they are breaking the law because they are too young to be working.

Mark allocation: 2 marks

- 1 mark for each reason given, or 2 marks for one reason and a justification.

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Question 4a.**Worked solutions**

Any three of the following

- It is water resistant, which is good because you water gardens.
- It is rot resistant, which is good because you don't want it to rot and fall apart.
- It is UV resistant, which is good because garden beds are outside.
- It is resistant to insects and bacteria, which is good because you don't want termites.
- eWood® can be painted and varnished so you can paint it to match your garden.

Mark allocation: 6 marks

- 1 mark for each correctly identified property or characteristic
- 1 mark for each logical explanation

Question 4b.**Worked solution**

People	<ul style="list-style-type: none"> • People who are concerned about the environment; more likely to be over 25, with a medium to high income and a home that has a garden
Product	<ul style="list-style-type: none"> • Environmentally friendly garden beds or vegetable gardens
Place	<ul style="list-style-type: none"> • Sell online • Sell at Bunnings or other gardening stores
Promotion	<ul style="list-style-type: none"> • Advertise in gardening magazines • Advertisements during television shows such as <i>Better Homes and Gardens</i> or <i>The Block</i> • Get a promotional piece on television show <i>Gardening Australia</i>
Price	<ul style="list-style-type: none"> • High, as it is a specialised product – it has green credentials, so can ask more • High, as the product will last a long time, so it is more cost-effective than most less durable options

Mark allocation: 10 marks

- 2 marks for each category (1 mark for each logical suggestion and 1 mark for each explanation)

**Tip**

- *The suggestions must be specific and logical, as per the sample above. Do not use broad terms such as 'women' (when identifying people) or 'shops' (when identifying place). These are not specific enough to define the target market or retail outlets. Similarly, in the promotion category, do not suggest publications or media outlets that are not relevant to the product being promoted (e.g. 'advertise in New Idea').*

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SECTION B

Question 1

Worked solution

The end user is the person who will use the product, so it has to suit their needs or they will not want to, or be able to, use it.

Mark allocation: 2 marks

- 2 marks for an explanation with a causal link
- 1 mark for an explanation without a causal link
- 0 marks for an explanation such as ‘because they are the client’ or ‘because you won’t get paid’

Question 2a.

Worked solution

The response to this question must be from the Design Brief insert and relate to the end user, e.g., not ‘must be in Christmas colours’ as this has no physical bearing for the user.

Mark allocation: 1 mark

- 1 mark for correctly identifying a relevant specification

Question 2b.

Worked solution

The response must give a logical reason why this is important.

Mark allocation: 2 marks

- 1 mark for a response with little detail
- 2 marks for a response with more detail

Question 2c.

Worked solution

The response must be in question form, e.g.:

Is the clothing warm enough for a cold night?

Is the dress easy to move in so the singer can dance easily?

Is the height of the throne comfortable for the user?

Is the podium light enough to move without hurting yourself?

Mark allocation: 1 mark

- 1 mark for correctly identifying an evaluation criterion

**SECTION B
TURN OVER**

Question 3**Worked solution**

Qualitative: Do a survey of 100 people asking what they think about when you say ‘an Australian Christmas’. Look for common themes in the results and select one of those.

Quantitative: Do a survey of 40 backstage crew, asking which of the design options would be easiest to move without tipping or being too heavy. Tally the results and select the option with the most votes.

Mark allocation: 4 marks

- 2 marks for each answer (1 mark for each test and 1 mark for how that would show suitability)

**Tip**

- *For a qualitative method, look for a test that is opinion- or feelings-based. For a quantitative method, look for a test that is data-driven.*

Question 4**Worked solution**

Type of obsolescence: functional

Justification: the product would still look good and has not been replaced by new products. It was only designed to look good and function safely for a limited time, so the materials and joinery used would not be of as high a quality as for a product expected to last for much longer.

Plus one of the following:

- The clothes might have been sewn onto the performer, so the costume will need to be cut off after the show.
- The throne might be screwed from the outside and spray-painted, so the joins are not as long-lasting and the finish will peel off quickly.
- The podium's plastic note rest might have been glued on rather than heat-bonded, so it might fall off after a few uses.

Mark allocation: 3 marks

- 1 mark for identifying 'functional' as the type of obsolescence
- 2 marks for the justification: 1 mark for an answer related to the physical nature of the product and 1 mark for the reasoning

**SECTION B
TURN OVER**

Question 5**Worked solution**

Product design factors used	Any three of: balance, emphasis, repetition, movement/rhythm, pattern, proportion, symmetry, space and surface qualities. OR Any three of: human-centred design, innovation and creativity, materials or technologies. OR A combination of three factors from both of the above. One mark for each correct answer listed.
Processes used from degree of difficulty list	Any two processes from the list. One mark for each correct answer listed.

Assessment criteria	
i. function/suitability of the design option for intended use	3 marks
ii. annotations on the design option that indicate how the requirements of the Design Brief insert have been met	3 marks
iii. use of visual, tactile and aesthetic product design factors in the design option	3 marks
iv. suitable use of processes and materials	3 marks
v. clarity and detail of drawing	3 marks
vi. innovation and creativity in the design option	4 marks

Mark allocation: 19 marks

- For i and ii, refer to the Design Brief insert. Is the outfit suitable for a children's event or does it show too much skin? Is there a jacket or a shawl? Is the throne easy to move? Does it have arms and a backrest? Does the podium have a place for notes and does it look stable? Do all items meet the theme?
- For iii, refer to the above.
- For iv, are the processes simple enough for a 'disposable' item? Are the materials suitable?
- For v, can you understand the drawing? Are there measurements/sizes? Is it of the standard expected in Year 12?
- For vi, is it a clever and creative solution (4 marks), or just a standard design with a Santa or another example of Christmas imagery on it (1 mark), or in between (2–3 marks)? Good work will be rewarded.

High-range response: $\frac{18}{19}$ marks

FEMALE FORMAL CLOTHING

Suitable for evening wear (i) (ii)

Professional & elegant (i) (ii)

Not too revealing (i) (ii)

Asymmetry (iii) (vi)

Materials: lightweight velvet & chiffon (iv)

Arm like leaf – innovative (vi)

Black fake-fur shawl (i, ii)

Waist gathered (iv)

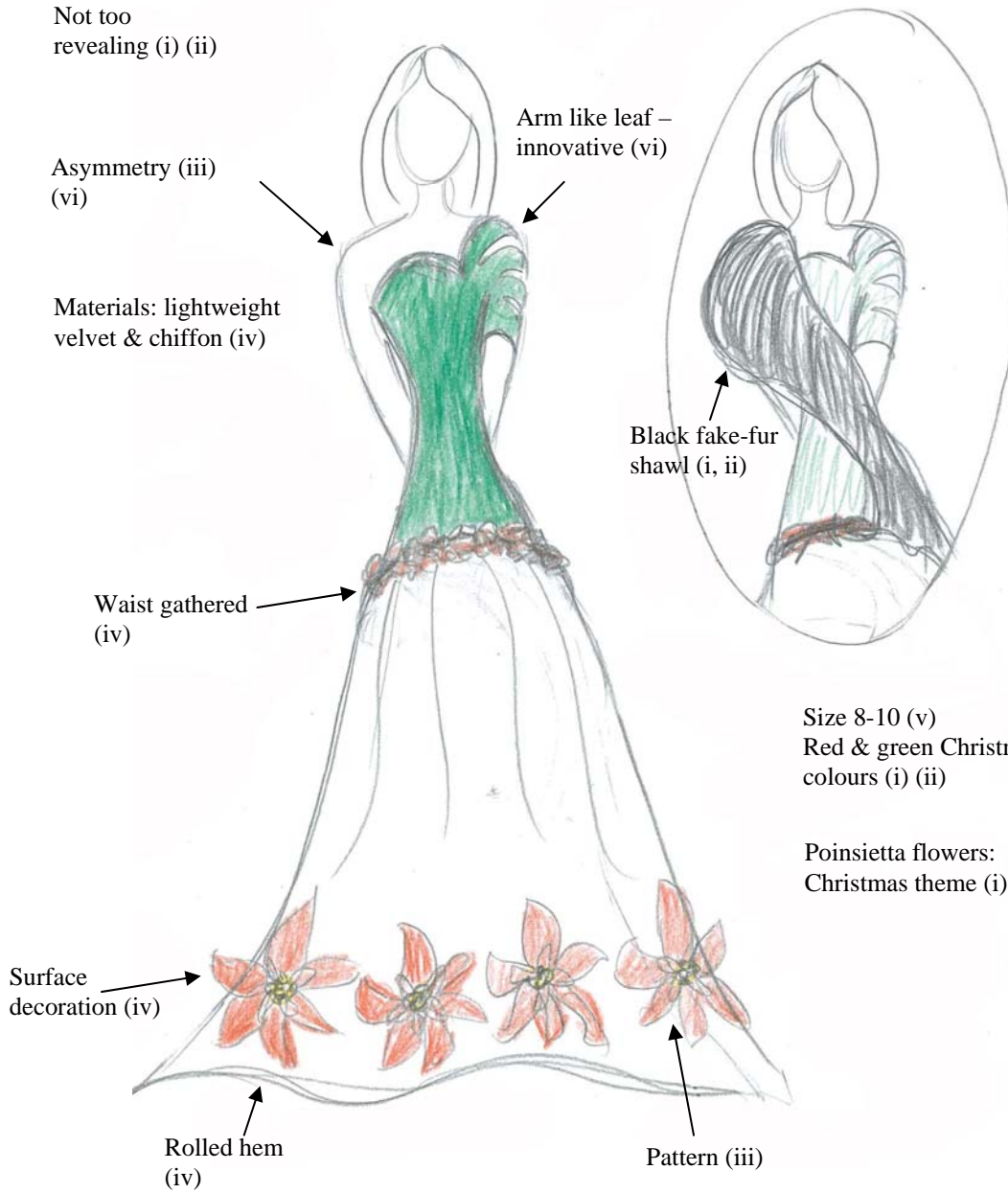
Size 8-10 (v)
Red & green Christmas colours (i) (ii)

Poinsettia flowers:
Christmas theme (i) (ii)

Surface decoration (iv)

Rolled hem (iv)

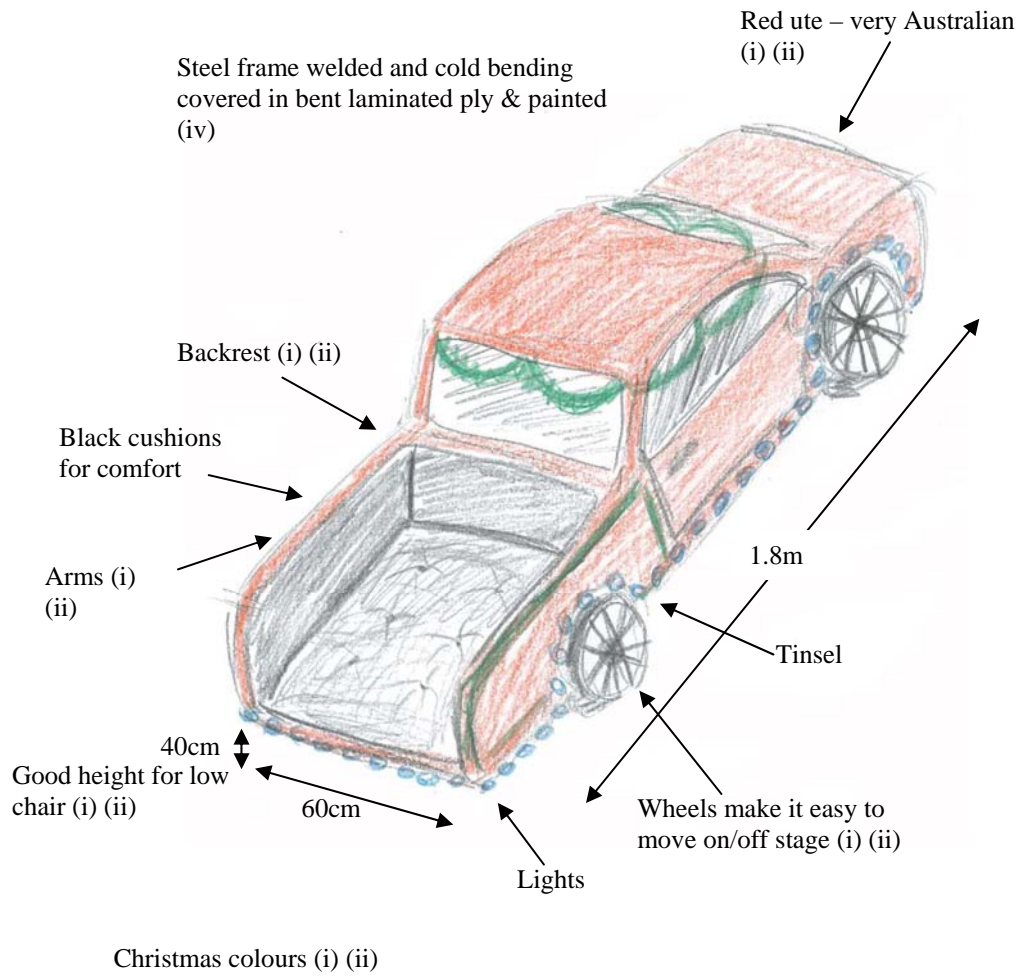
Pattern (iii)



Medium- to high-range response: $\frac{16}{19}$ marks (too big for function)

SANTA'S THRONE

Balance, proportion & symmetry used
 (iii)
 Innovative throne (iv)



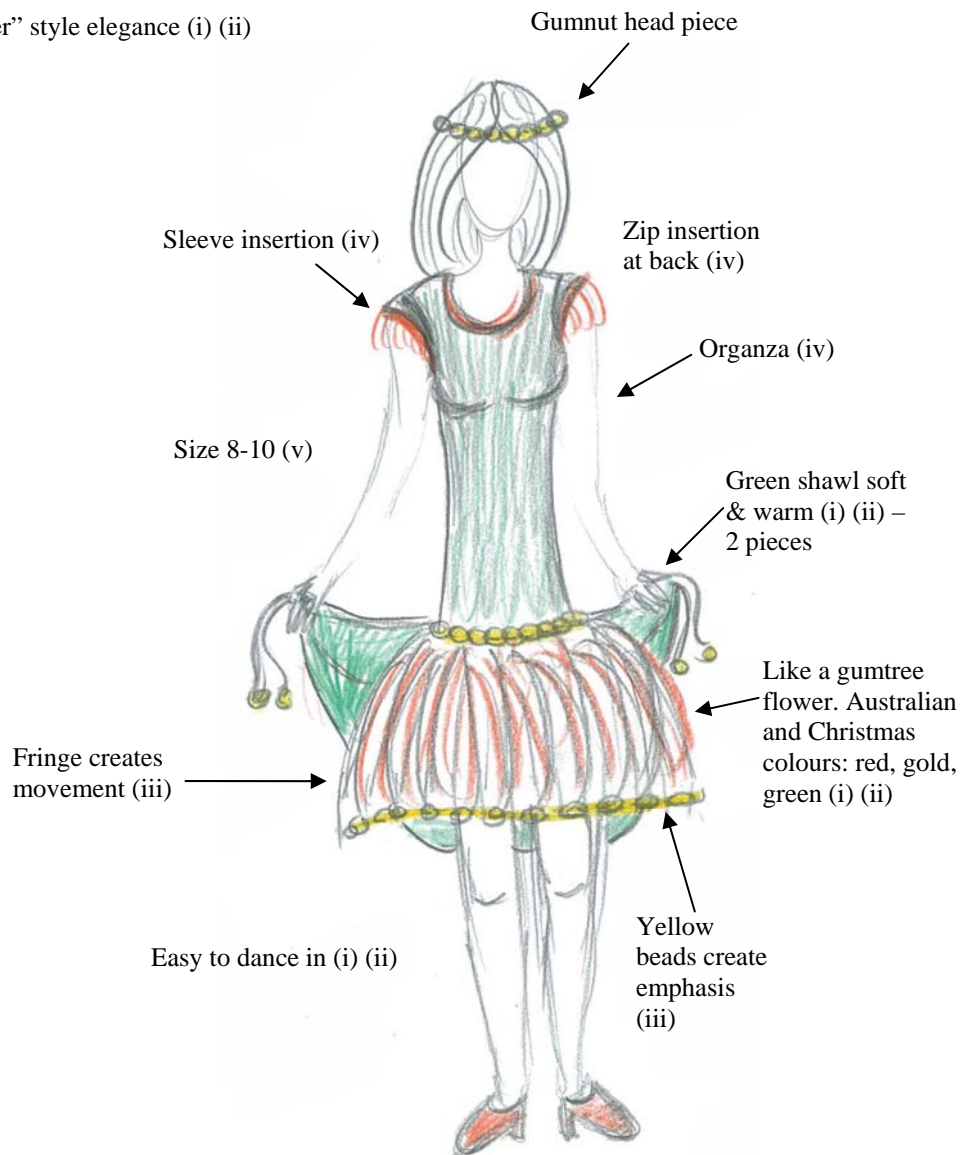
Medium- to low-range response: $\frac{14}{19}$ marks (medium innovation, low suitability)

FEMALE PERFORMER

Human-centred design dress is easy to move in but still looks good (iii)

Suitable for children (i) (ii)

“Flapper” style elegance (i) (ii)



Low-range response: $\frac{12-13}{19}$ marks (low on innovation, 2-3 marks for all other criteria)

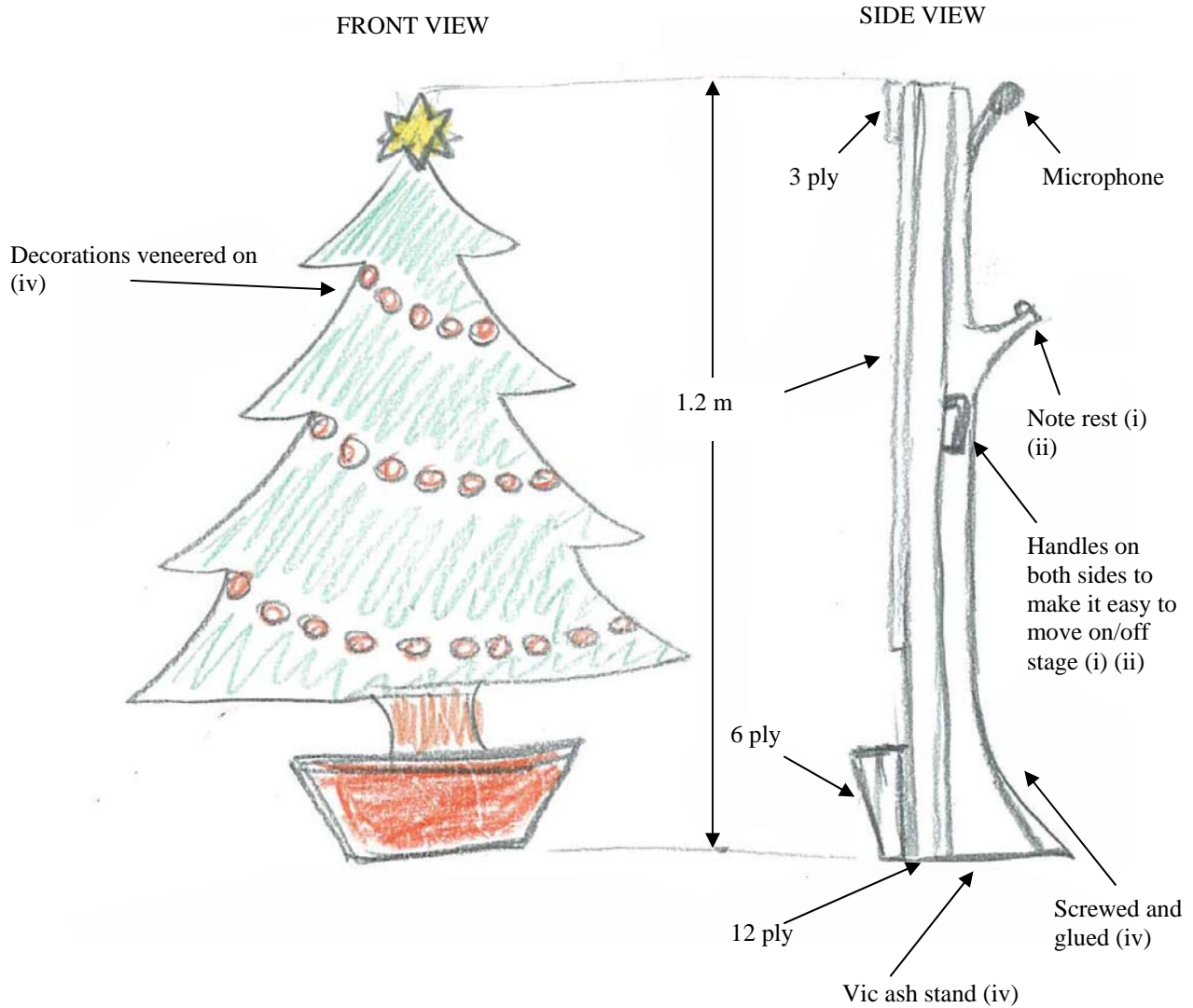
PODIUM

Christmas tree shape for podium – innovative (iv)

Christmas colours (i) (ii)

Balance & symmetry (iii)

Not too big (i) (ii)



Question 6a.**Worked solution**

The item is unique – no one else has it.

It is generally of a high quality as it is handmade.

Mark allocation: 2 marks

- 1 mark for each correct answer

Question 6b.**Worked solution**

Can be much more expensive.

Can take much longer to make.

Mark allocation: 2 marks

- 1 mark for each correct answer

Question 6c.**Worked solution**

Yes, the product will still need to meet some Australian Standards because it is being used by people so it must be safe to use. Some products, such as flannel pyjamas or baby cots, have mandated standards that they must meet. Others don't. However, every product must meet minimum requirements to be safe to use and not cause an injury.

May also include one of the following

The clothes must not have pins left in them.

The throne must not have exposed nail or screw ends.

The podium would need an electrician to wire up the microphones.

Mark allocation: 4 marks

- 1 mark for answering 'yes'
- 1–3 marks for a considered answer; must relate to safety. Responses may or may not refer to the specific product designed for the Carols.

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Question 7a.**Worked solutions**

I would need to overlock the seams and include a zip for access.

OR

I would rivet the joins instead of gluing them to make them more durable.

OR

I would use Victorian Ash instead of medium-density fibreboard (MDF).

Mark allocation

- 1 mark for the process or material identified

Question 7b.**Worked solutions**

This would strengthen the seams and make them more long-wearing; it would prevent the dress from tearing. The zip means that the dress could be reused, and overlocking is quick and easy for factory workers to do.

OR

The glue joins were strong enough to last for a week or so, but not if someone rested too heavily on the note shelf. The rivets would be much stronger, which would make the product last much longer. Rivets can be done with a machine, so this is suitable for low-volume manufacture.

OR

MDF is quick and easy to use for a 'prop' but is not really a furniture timber. It is also not as safe to work with as Victorian Ash. Changing the material will make the product last longer and be safer for the workers to use in manufacture.

Mark allocation: 3 marks

- A 3-mark answer must show an understanding of how changing a material or a process has an impact on the product. This impact could be in terms of making it longer lasting, making it cheaper to produce or making it easier to manufacture. The answer should not refer to a bulk- or mass-manufacture situation.

END OF SAMPLE RESPONSES