

Write your name here	
Surname	Other names
Centre Number	Candidate Number
Edexcel GCE	
<h1>Design and Technology</h1> <h2>Product Design: Graphic Products</h2> <h3>Advanced Subsidiary</h3> <h3>Unit 2: Design and Technology in Practice</h3>	
Wednesday 18 May 2011 – Afternoon Time: 1 hour 30 minutes	Paper Reference 6GR02/01
You do not need any other materials.	Total Marks

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches it must be dark (HB or B). Coloured pens, pencils and highlighter pens must not be used.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 70.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
– *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

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Answer ALL the questions. Write your answers in the spaces provided.

1 Figure 1 shows a pictorial drawing of an architectural model made by a student in a school workshop.

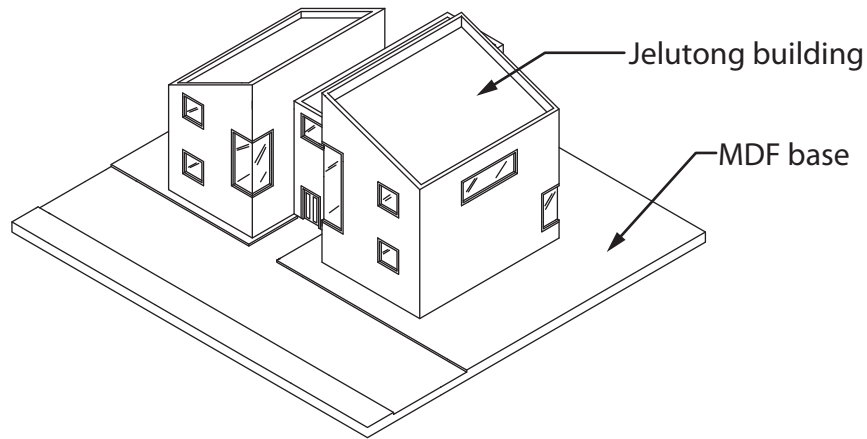


Figure 1

(a) Explain **one** advantage of making an architectural model.

(2)

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(b) (i) The model base will be manufactured using MDF.

State **one** reason why MDF will be used for the base of the architectural model.

(1)

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(ii) Jelutong will be used to make the building.

Give **one** mechanical property and **one** functional property of Jelutong.

(2)

Mechanical property

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Functional property

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(c) PVA adhesive will be used during the construction of the model.

State **one** advantage and **one** disadvantage of PVA adhesive.

(2)

Advantage

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Disadvantage

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(d) The scroll saw in Figure 2 below was used to cut the Jelutong pieces for the model.



Figure 2

Complete the risk assessment table below.

Hazard	Risk	People at risk	Control
Using the scroll saw		User	(1)
			(1)



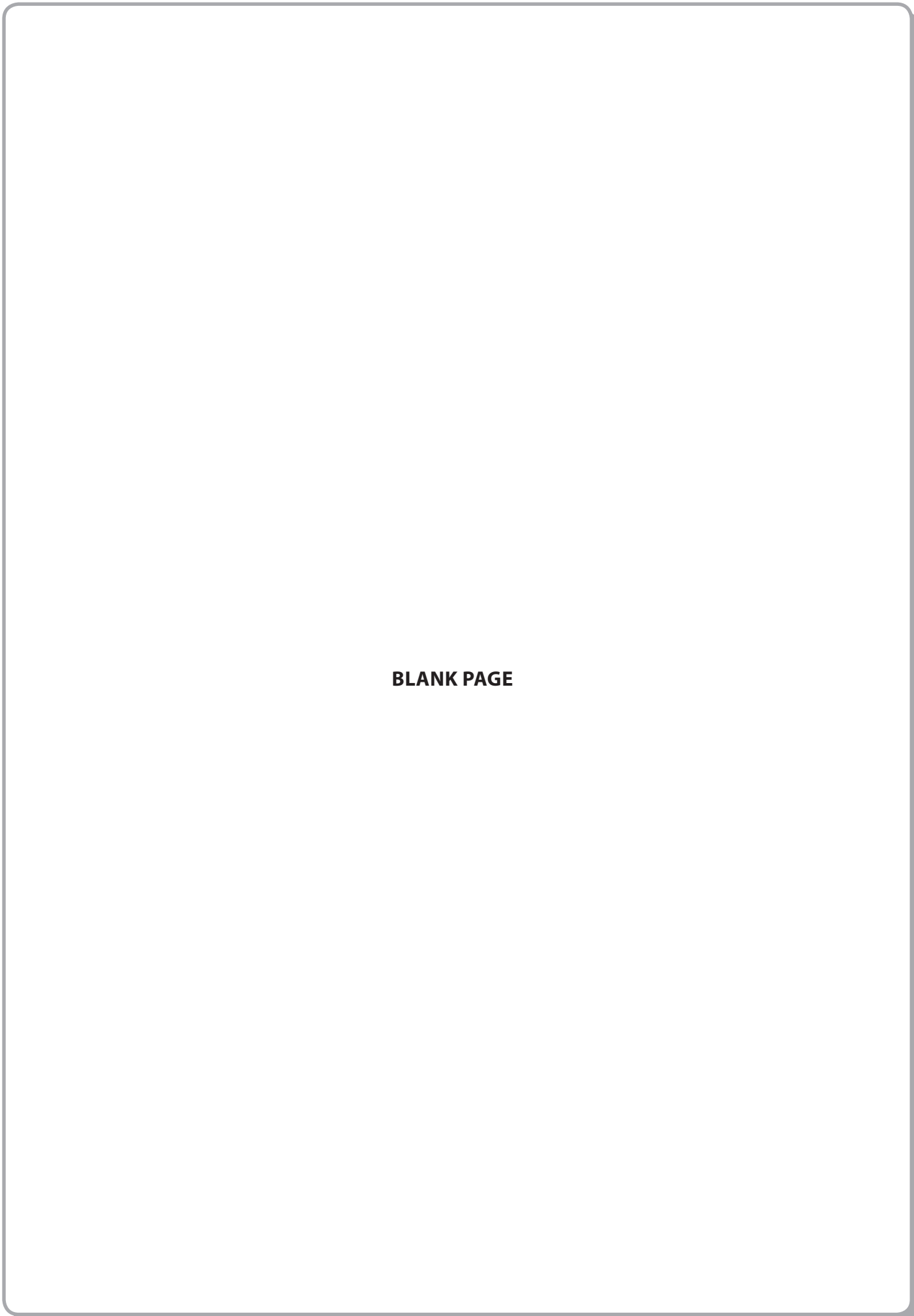
(e) Safety signs are displayed in the workshop in accordance with the Health and Safety at Work Act 1974.

Complete the table below.

Sign	Meaning
	(1)
	(1)
	(1)
	(1)

(Total for Question 1 = 14 marks)





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2 Figure 3 shows a new concept toaster in third angle orthographic projection.

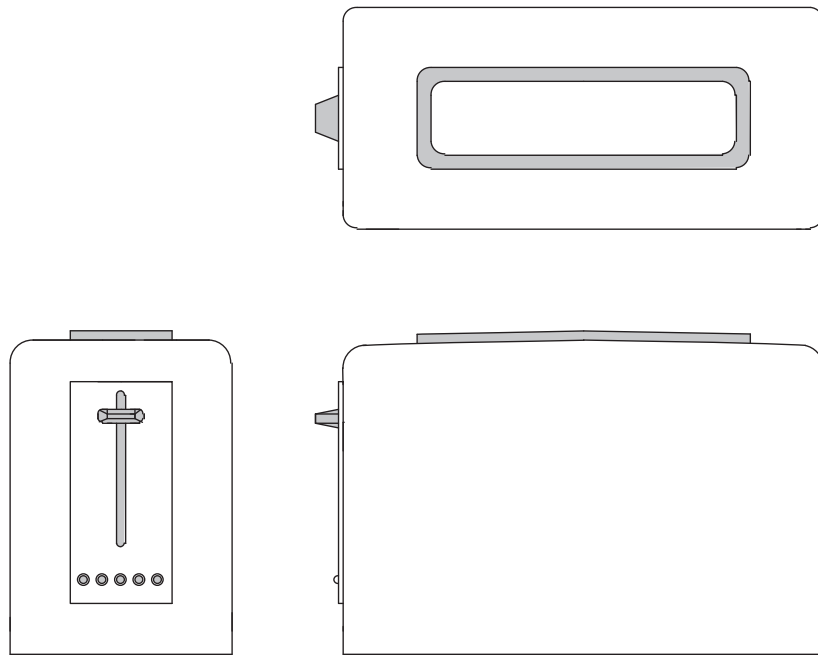


Figure 3



(a) In the space below, draw a two point perspective pictorial drawing of the toaster shown in Figure 3.

Your sketch should clearly show the toaster and the perspective construction lines.

(5)



(b) Figure 4 shows the symbol found on the toaster case.



Figure 4

State the specific polymer that HDPE represents.

(1)

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(c) Screen-printed decorative patterns will be applied to the side panel of the toaster shown in Figure 3.

(i) Give **two** advantages of the screen printing process.

(2)

1

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(ii) Give **one** disadvantage of the screen printing process.

(1)

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(d) Explain why rapid prototyping was used at the development stage in the production of the concept toaster.

(3)

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(e) Computer aided inspection is frequently used in total quality management (TQM) systems.

Outline how computer aided inspection can be used to ensure a high degree of accuracy in the printing process.

(2)

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(Total for Question 2 = 14 marks)



3 Figure 5 shows a cyclist's crash helmet.



Figure 5

(a) The cyclist's crash helmet is manufactured using injection moulding.
Using annotated sketches describe the injection moulding process.

(4)

Blank area for annotated sketches.



(b) Safety stripes are added to the cyclist's crash helmet using phosphorescent pigments.

Explain how phosphorescent pigments glow in the dark.

(2)

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(c) A glass reinforced plastic (GRP) cyclist's crash helmet is also available.

Outline the stages in the manufacturing process for the production of the glass reinforced plastic (GRP) cyclist's crash helmet.

(4)

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(d) The cyclist's crash helmet undergoes testing before being sold to the public using the following methods:

- testing to destruction
- non-destructive testing

Outline the key features of **one** of these methods of testing.

(2)

Chosen testing method:

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(e) The cyclist's crash helmet is packaged in a protective box with expanded polystyrene inserts.

Explain why expanded polystyrene is used in this situation.

(2)

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(Total for Question 3 = 14 marks)



4 Figure 6 shows a mass produced case-bound hard cover book.



Figure 6

(a) Outline **two** advantages and **one** disadvantage of case-bound books.

(3)

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(b) The pages of the book are made of commercial bond paper.

State **two** properties that make commercial bond paper suitable for case-bound books.

(2)

1

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2

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(c) The cover is embossed with a pattern to add aesthetic appeal.

Using annotated sketches describe the embossing process.

(4)



(d) Hot-foil blocking is used to print the title of the book onto the front cover.

Outline why hot-foil blocking is used.

(3)

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(e) Justify the use of recycled board for the covers of case-bound books as opposed to using solid white board.

(2)

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(Total for Question 4 = 14 marks)



5 Figure 7 shows a modern sports watch.



Figure 7

(a) The case of the watch is made from stainless steel.

Discuss the use of stainless steel for this type of watch.

(4)

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*(b) The watch has an electroluminescent (EL) lit dial.

Outline how electroluminescent (EL) lighting works.

(5)

Area with horizontal dotted lines for writing the answer.



* (c) Manufacturers often become accredited to the British Standards Institute (BSI) quality management system, known as ISO 9000.

Evaluate the use of the ISO 9000 quality management system and how this affects employers, their employees and their customers.

(5)

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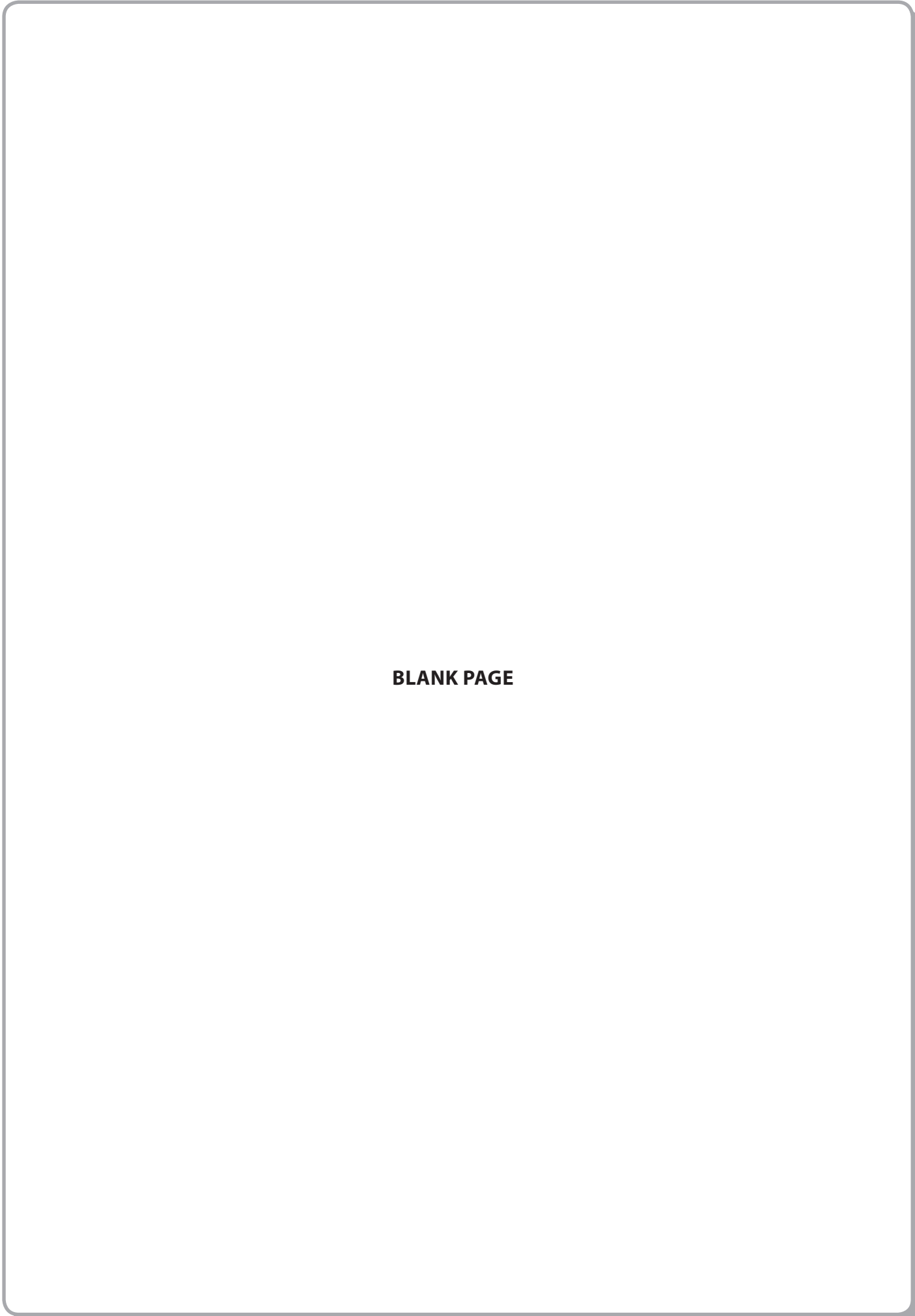
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(Total for Question 5 = 14 marks)

TOTAL FOR PAPER = 70 MARKS





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