



**Answer ALL questions in Section A and Section B.**

**SECTION A**

**Answer ALL questions in this section. Write your answers in the spaces provided.**

1. All of the products listed below belong to a manufacturing sector.

(a) Tick the **two** boxes below where the products belong to the **mechanical** sector.

Product	Tick <b>two</b> boxes below
Train ticket	
Hydraulic arm	
GCSE certificate	
Pasta sauce	
Games console	
Metal curtain rail	

(2)

(b) Tick the **two** boxes below where the products belong to the **automotive** sector.

Product	Tick <b>two</b> boxes below
Petrol pump sign	
Wrought iron fence	
Windscreen wiper	
Geography encyclopaedia	
Exhaust manifold	
Shopping catalogue	

(2)

Q1

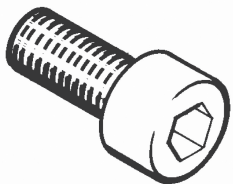

**(Total 4 marks)**



2. The tables below show some components used in the manufacture of mechanical, automotive products.

(a) Complete **Table 1** by naming the components.



**Table 1**

Component	Component name	Use
		Semi permanent fastener, used with a key to join two parts together.
		Used to provide flexible support and movement between parts. They stretch when loaded.

(2)

(b) Complete **Table 2** by explaining the use of the components.

**Table 2**

Component	Component name	Use
	Gear	
	Circlip	

(4)

(Total 6 marks)

Q2



3. Draw a straight line to link each term listed below to the correct key area.

Each key area can be used more than once.

**Term**

**Key area**

High density polyethylene (HDPE)

(1)

Information and communications technology (ICT)

Embedded computers

(1)

Presentation software

(1)

Control technology

Aluminium alloy

(1)

Thermostat

(1)

Modern materials

Voice over internet protocol (VoIP)

(1)

(Total 6 marks)

Q3



4. Mass produced side lever grease guns belong to the mechanical, automotive sector.

(a) (i) Name **one** other product from this sector, apart from a side lever grease gun, that utilises, in its manufacture, information and communications technology and a modern material.

.....  
(1)

(ii) Explain the purpose of the product.

.....  
.....  
.....  
(2)

(b) (i) Name **one** stage in the manufacture of the product you gave in 4(a)(i) where information and communications technology is used.

.....  
(1)

(ii) Explain **one** advantage to the **manufacturer** of using information and communications technology at this stage.

.....  
.....  
.....  
(2)

(c) (i) State **one** modern material used in the manufacture of the product you named in 4(a)(i).

.....  
(1)

(ii) Describe how this modern material improves the characteristics of the product.

.....  
.....  
.....  
.....  
(2)

(Total 9 marks)

Q4



5. Computer-aided design (CAD) and communications technology are used by manufacturers of mechanical, automotive products.

(a) (i) Give **two** examples of **how** CAD is used by a manufacturer.

Example 1 .....

Example 2 ..... (2)

(ii) Using an example from 5(a)(i), explain **one** benefit to the **manufacturer** of using CAD.

.....

.....

..... (2)

(b) (i) Give **two** examples of a communications technology as used by a manufacturer.

Example 1 .....

Example 2 ..... (2)

(ii) Using an example from 5(b)(i), explain **one** benefit to the **manufacturer** of using communications technology.

.....

.....

..... (2)

(Total 8 marks)

Q5



6. (a) Smart materials are used in some mechanical, automotive products.

Explain the term 'smart material'.

.....  
.....  
..... (2)

(b) Computer-aided manufacture (CAM) is used by manufacturers of mechanical, automotive products.

Explain **three** benefits to a manufacturer of using CAM.

Benefit 1 .....  
..... (2)

Benefit 2 .....  
..... (2)

Benefit 3 .....  
..... (2)

(Total 8 marks)

Q6



7. (a) Control technology is an essential feature in mechanical, automotive product manufacture.

Explain the impact of control technology on safety when manufacturing.

.....  
.....  
.....  
.....

(2)

(b) Handling information and data is an essential feature of mechanical, automotive manufacturers.

Explain how the use of information and data handling systems benefit the manufacturer, when marketing products.

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.....  
.....  
.....

(2)

(Total 4 marks)

Q7

**TOTAL FOR SECTION A: 45 MARKS**





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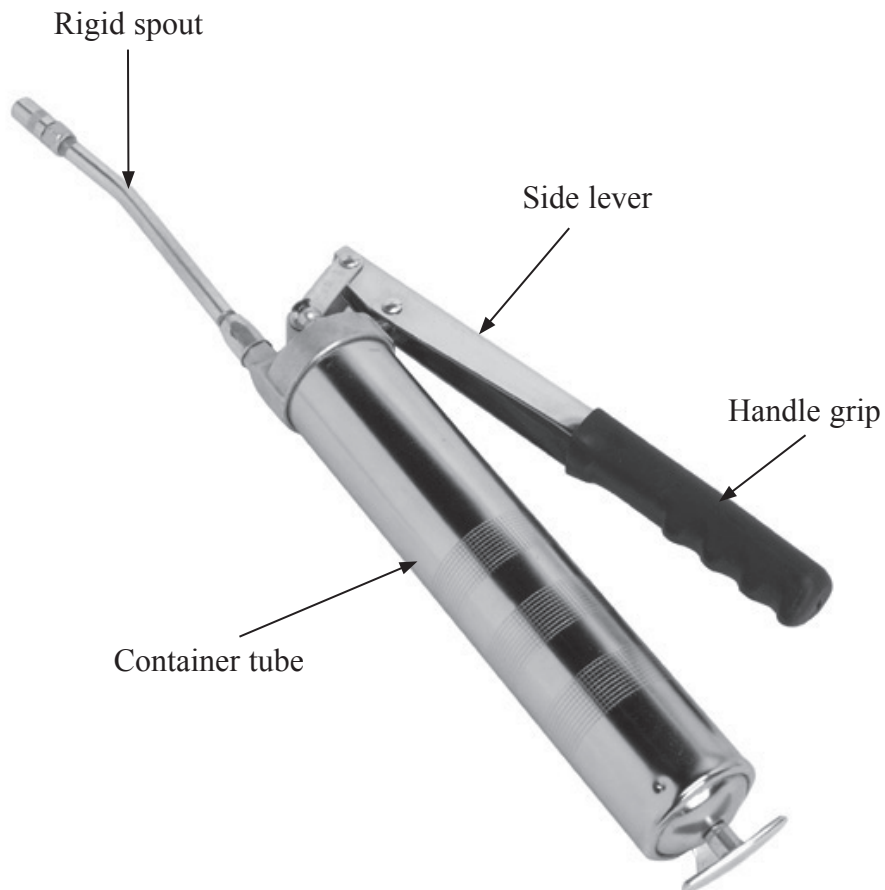
**TURN OVER FOR SECTION B**



## SECTION B

Answer ALL questions in this section with reference to the manufacture of mass produced side lever grease guns. Write your answers in the spaces provided.

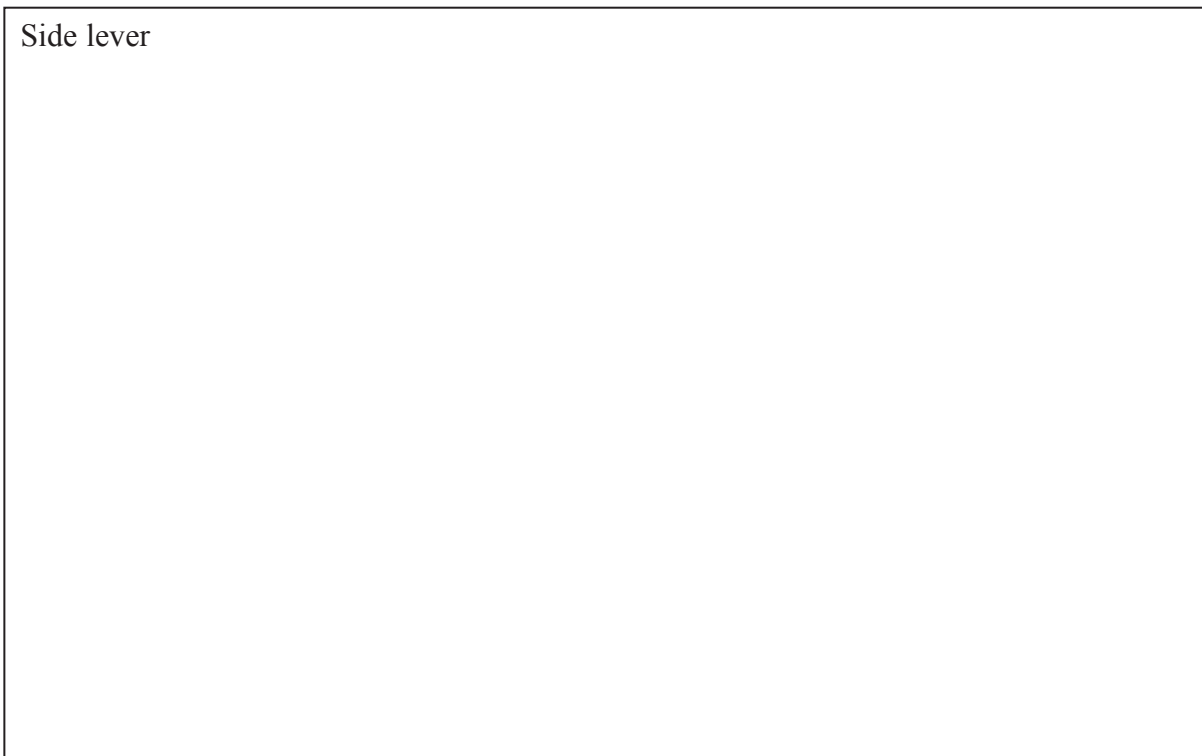
The diagram below shows a mass produced side lever grease gun.



8. In the boxes below, describe, using notes and sketches:

(a) the function of the side lever

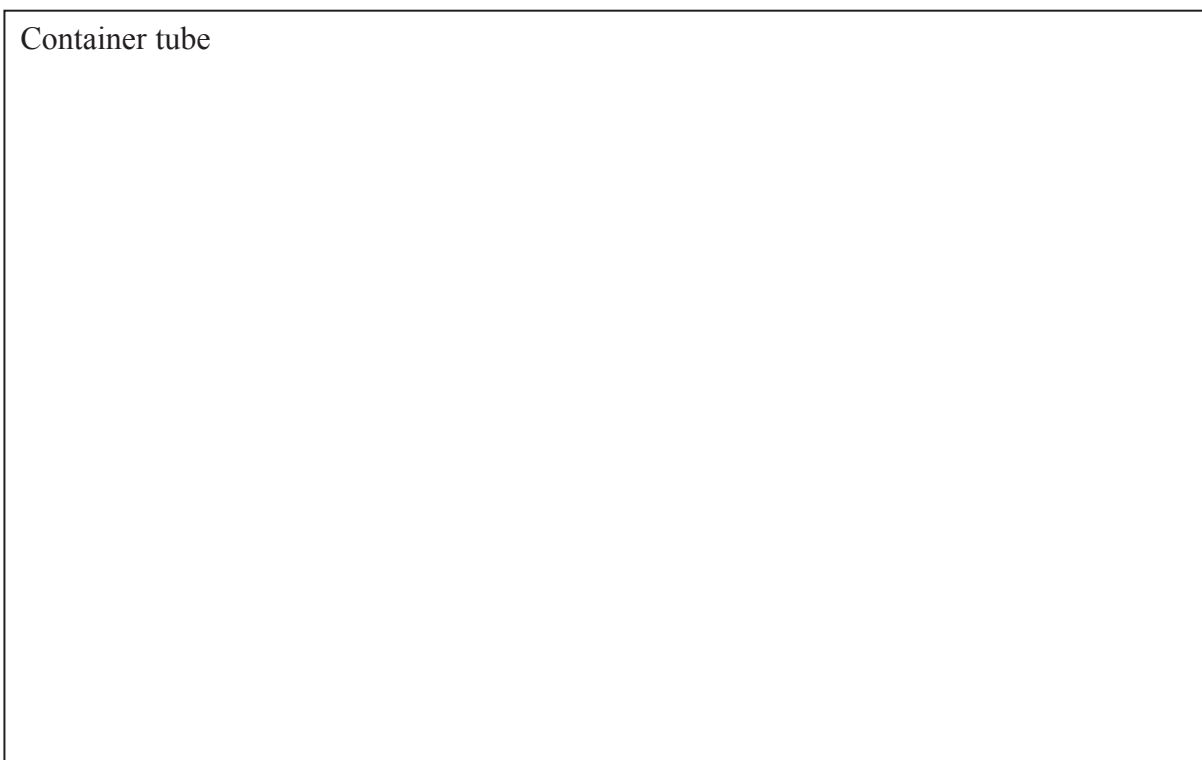
Side lever



(3)

(b) the function of the container tube.

Container tube



(3)

(Total 6 marks)

Q8



9. (a) The following table indicates some of the main stages in manufacturing mass produced side lever grease guns.

(i) Complete the table below by giving the **two** missing stages in manufacturing mass produced side lever grease guns.

Stages in manufacturing	
1	Design
2	Marketing
3	
4	
5	Production
6	Assembly and Finishing
7	Packaging and Dispatch

(2)

(ii) State the stage in manufacturing where the mass produced side lever grease guns are delivered to **distributors**.

Stage .....

(1)

(b) Describe the following **two** stages in the manufacture of mass produced side lever grease guns.

(i) Design .....

.....

.....

.....

.....

(3)

(ii) Production .....

.....

.....

.....

.....

(3)

(Total 9 marks)

Q9



10. (a) The spout on the side lever grease gun needs to be rigid and resistant to corrosion.

(i) Name a specific material commonly used to manufacture the rigid spout.

..... (1)

(ii) Name a suitable treatment process to improve the corrosion resistance of the rigid spout.

..... (1)

(b) A polymer would be a suitable material to use for the handle grip on the side lever grease gun. Injection moulding is a process used to make the handle grip.

(i) State **two** reasons why a polymer would be suitable.

Reason 1 .....

Reason 2 ..... (2)

(ii) Explain why injection moulding is a suitable process for manufacturing the handle grip.

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.....  
.....  
.....  
..... (3)

(c) Explain how the use of modern materials has made mass produced side lever grease guns appeal to the **consumer**.

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.....  
.....  
.....  
..... (3)

(Total 10 marks)

Q10

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11. (a) Describe **two** quality control procedures used at the production stage when manufacturing mass produced side lever grease guns.

(i) Quality control procedure 1

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.....  
(2)

(ii) Quality control procedure 2

.....  
.....  
(2)

(b) Explain **one** benefit of applying each quality control procedure, described in 11(a), to the **manufacturer**.

(i) Benefit of procedure 1

.....  
.....  
(2)

(ii) Benefit of procedure 2

.....  
.....  
(2)

(c) Explain **one** benefit of applying each quality control procedure, described in 11(a), to the **distributor**.

(i) Benefit of procedure 1

.....  
.....  
(2)

(ii) Benefit of procedure 2

.....  
.....  
(2)

(Total 12 marks)

Q11

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12. The utilisation of modern technology in the manufacture of mass produced side lever grease guns has brought changes.

(a) (i) State **one** change the use of modern technology has had on the workforce.

.....  
(1)

(ii) Explain **two** different effects this change has had on the workforce.

Effect 1 .....

.....  
(2)

Effect 2 .....

.....  
(2)

(b) State **one** change the use of modern technology has had on the working environment.

.....  
(1)

(c) Explain **two** benefits the use of modern technology has had on the global environment.

Benefit 1 .....

.....  
(2)

Benefit 2 .....

.....  
(2)

(Total 10 marks)

Q12

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TURN OVER FOR QUESTIONS 13 AND 14



13. Modern materials are used in the manufacture of mass produced side lever grease guns.

Explain how the use of modern materials has impacted on development and final product costs.

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(Total 4 marks)

Q13

14. Manufacturing mass produced side lever grease guns uses energy. Modern engineering processes operate more efficiently than traditional processes.

Explain why the use of modern engineering processes may lead to **increased** energy consumption.

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(Total 4 marks)

Q14

**TOTAL FOR SECTION B: 55 MARKS**  
**TOTAL FOR PAPER: 100 MARKS**

**END**

