



**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.

Products	Tick <b>two</b> boxes below
High-visibility vest	
Flat screen TV	
Icing sugar	
Metal door lock	
Liquid soap	
Fire extinguisher	

(2)

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

Products	Tick <b>two</b> boxes below
Wheel bearing	
USB stick	
Driving gloves	
Road atlas	
Science textbook	
Brake disc	

(2)

Q1


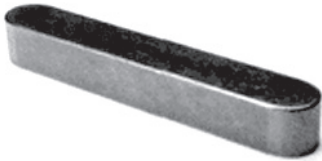
(Total 4 marks)



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

(a) Complete Table 1 by naming each component.

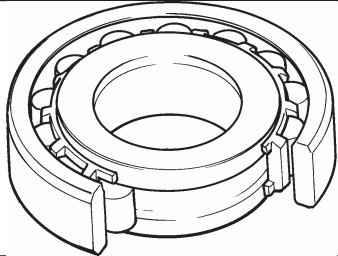
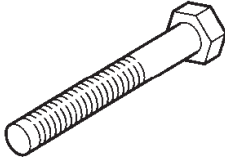
**Table 1**

Component	Component name	Use
		Used as a semi permanent or permanent fixing between two components/ sheets or plates.
		Fits in a machined slot on a shaft to help hold another round component in place.

(2)

(b) Complete Table 2 by explaining the use of each component.

**Table 2**

Component	Component name	Use
	Bearing	
	Hexagonal headed bolt	

(4)

Q2

(Total 6 marks)



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**

Continuous operation

(1)

Information and communications technology (ICT)

Computer-aided design (CAD)

(1)

Databases

(1)

Control technology

Polymers

(1)

Automation

(1)

Modern materials

Composites

(1)

(Total 6 marks)

Q3



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4. Bench pillar drills belong to the mechanical, automotive sector.

(a) (i) Name **one** other product from this sector, apart from a bench pillar drill, that utilises in its manufacture information and communication 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 design of the product.

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

(Total 9 marks)

Q4



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blank

5. (a) Explain **three** benefits to a **manufacturer** of using computer-aided manufacture (CAM).

1 .....

.....

2 .....

.....

3 .....

.....

(6)

(b) Explain how the use of CAM in product manufacture encourages the **consumer** to buy the product.

.....

.....

.....

(2)

(Total 8 marks)

Q5



Leave  
blank

6. In the mechanical, automotive industries, communications technology is used to transfer information between suppliers, manufacturers and distributors.

(a) (i) State **one** type of communications technology used to transfer information between suppliers and manufacturers.

.....  
(1)

(ii) Describe how the use of this communications technology benefits the **manufacturer**.

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

(b) (i) Describe **one** way in which communications technology is used to transfer sales information from automotive product distributors to manufacturers.

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

(ii) Explain how the use of this communications technology benefits the **distributor**.

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

(Total 8 marks)

Q6



Leave  
blank

7. (a) Explain **one** advantage, other than a financial benefit, of introducing automation to the production stage in mechanical, automotive product manufacture.

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.....  
.....

(2)

(b) Explain **one** disadvantage of introducing automation to the production stage in mechanical, automotive product manufacture.

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.....  
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(2)

(Total 4 marks)

Q7

**TOTAL FOR SECTION A: 45 MARKS**





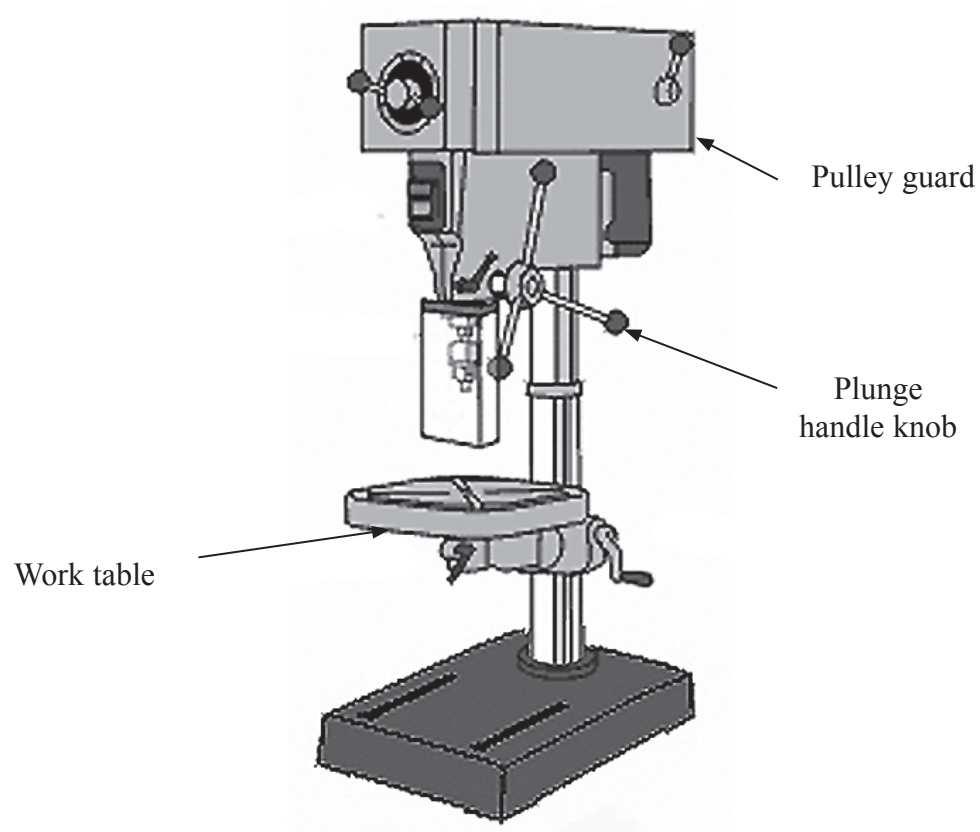
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**TURN OVER FOR SECTION B**



**SECTION B**

**Answer ALL questions in this section with reference to the manufacture of mass produced bench pillar drills. Write your answers in the spaces provided.**

The diagram below shows a bench pillar drill.



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

(a) the function of the pulley guard

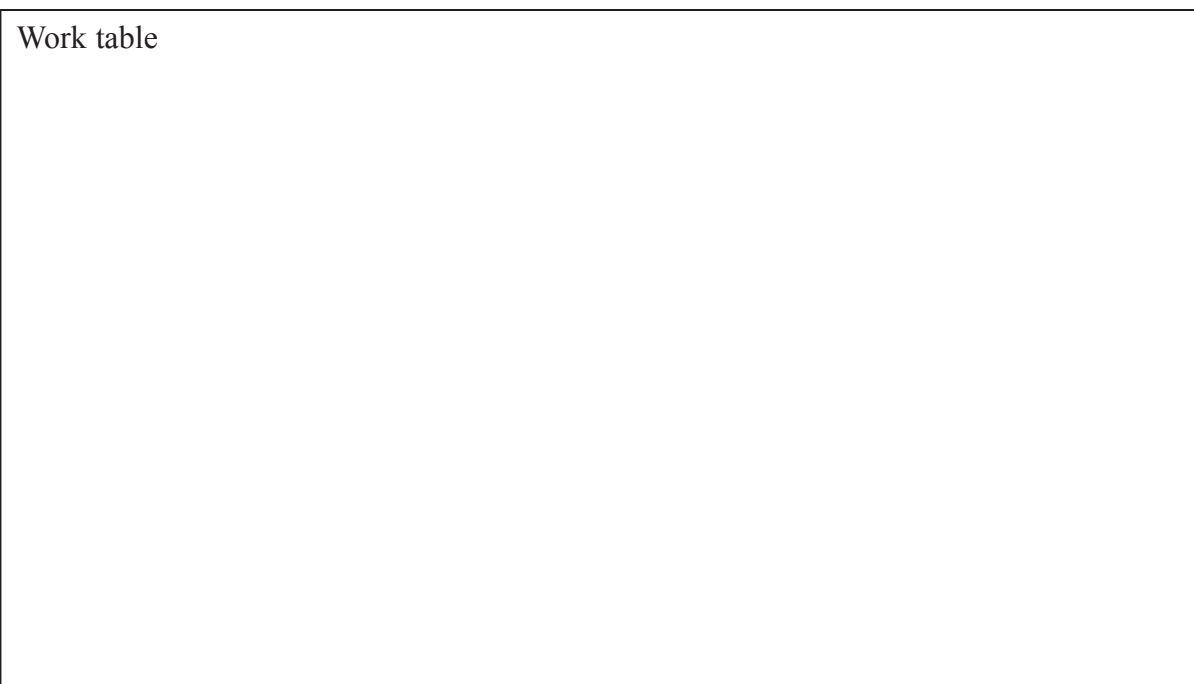
Pulley guard



(3)

(b) the function of the work table.

Work table



(3)

Q8

(Total 6 marks)



9. (a) The following table indicates some of the main stages in manufacturing bench pillar drills.

(i) Complete the table below by giving the **two** missing stages in manufacturing bench pillar drills.

Stages in manufacturing	
1	Design
2	
3	
4	Material supply and control
5	Production
6	Assembly
7	Packaging and dispatch

(2)

(ii) State the stage where the moulding of the pulley guards would be carried out.

Stage .....

(1)

(b) Describe the following **two** stages in the manufacture of bench pillar drills.

(i) Assembly .....

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

(3)

(ii) Packaging and dispatch .....

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

(3)

(Total 9 marks)

Q9



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10. (a) Name the specific material commonly used in manufacturing each of the following parts of the bench pillar drill:

(i) the plunge handle knob

..... (1)

(ii) the base

..... (1)

(iii) the clear guard around the chuck.

..... (1)

(b) Injection moulding is a production process and is used in the manufacture of bench pillar drills.

(i) State **two** production processes, other than injection moulding, used during the manufacture of bench pillar drills.

1 .....

2 .....

(2)

(ii) Explain why injection moulding is used.

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

(2)

(c) Explain how the use of modern materials has helped the **manufacturer** of bench pillar drills to develop new products.

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

(Total 10 marks)

Q10

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11. (a) (i) Give **one** application of quality control during the **production or assembly stage** of the manufacture of bench pillar drills.

.....  
(1)

(ii) Describe how quality could be checked in this application.

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

(iii) Explain the benefits to the bench pillar drill user of the use of quality control.

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

(b) (i) Apart from quality control, state **one type** of computer control in the **production or assembly stage** of the manufacture of bench pillar drills.

.....  
(1)

(ii) Describe the use of this type of computer control.

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

(c) Explain the benefits to the **manufacturer** of the use of computer control.

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

(Total 12 marks)

Q11



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12. Information and communications technology (ICT) plays an important role in the manufacture and sales of bench pillar drills.

(a) (i) State **two** uses of ICT in the marketing stage.

1 .....

2 .....

(2)

(ii) Describe **one** use of ICT in the packaging and dispatch stage.

.....

.....

.....

(2)

(b) Explain **one** benefit of the use of ICT to the distributor of bench pillar drills.

.....

.....

.....

(2)

(c) Explain the impact ICT has on the design, development and production of bench pillar drills.

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(4)

(Total 10 marks)

Q12

TURN OVER FOR QUESTION 13



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**13.** Automation is often introduced within the manufacture of bench pillar drills.

(a) Explain how the introduction of automation has impacted on product cost and the opportunity to introduce new product designs.

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**(4)**

(b) Evaluate the effect of the use of automation on the workforce and the working environment.

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.....  
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**(4)**

**Q13**

**(Total 8 marks)**

**TOTAL FOR SECTION B: 55 MARKS**

**TOTAL FOR PAPER: 100 MARKS**

**END**

