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Answer ALL the questions in Section A and Section B.

SECTION A

Answer ALL the 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 two boxes below
Soy sauce	
Metal door handle	
Baseball cap	
China mug	
Mobile phone	
Hydraulic valve	

(2)

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

Products	Tick two boxes below
Carrier bag	
Gearbox	
De-icer	
Safety air bag	
Road bridge	
Cargo pants	

(2)

Q1

(Total 4 marks)



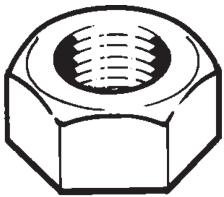
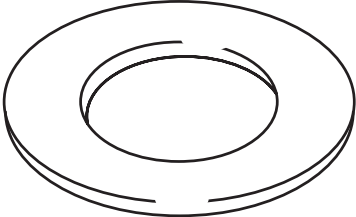
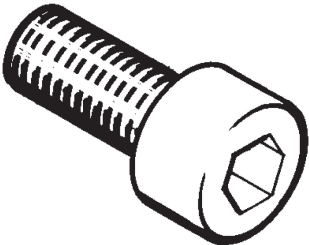
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2. The table shows some components used in the manufacture of products.

Complete the table by:

- (a) Naming each component;
- (b) Explaining what each component is used for.

The first one is done for you.

Component	Component Name	Use
	Nut	Used with a bolt as a temporary fastening.
		
		

(3)

(3)

(Total 6 marks)

Q2



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

Each key area can be used more than once.

Term

Key area

Computer Integrated Manufacturing (CIM)

Information and Communications Technology (ICT)

Shape memory alloys

Process control

Modern materials

Adhesives

Internet sites

Control technology

Databases

Q3

(Total 6 marks)



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4. Pneumatic cylinders belong to the mechanical, automotive sector.

(a) (i) Name **one** other product from this sector, apart from **pneumatic cylinders**, that utilises in its manufacture control technology and modern materials.

.....
(1)

(ii) Explain how the product can be used.

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

(b) (i) State **one** stage in the manufacture of the product you named in 4(a)(i) where control technology is used.

.....
(1)

(ii) Explain **one** advantage to the **manufacturer** of using control 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



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5. Computer-aided manufacture (CAM) and Computer-aided design (CAD) are both used by manufacturers of mechanical and automotive products.

(a) (i) Give **one** example of where Computer-aided manufacture (CAM) is used by a manufacturer.

.....
(1)

(ii) Explain the benefits to the **manufacturer** of using Computer-aided manufacture (CAM) relating to the example given in 5(a)(i).

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

(b) (i) Give **one** example of how Computer-aided design (CAD) is used by a manufacturer.

.....
(1)

(ii) Explain the benefits to the **manufacturer** of using the Computer-aided design (CAD) relating to the example given in 5(b)(i).

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

(c) Explain **one** benefit to the **distributor** of the manufacturer using Computer-aided manufacture (CAM).

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

(Total 8 marks)

Q5



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6. Communications technology is now widely used by manufacturers.

(a) Name **two** examples of communications technology.

(b) Describe the traditional communications method it has replaced.

(c) Explain **one** benefit to the manufacturer of using this replacement new technology.

Example 1

Communications technology 1
.....
(1)

Method it has replaced
.....
(1)

Benefit of replacement
.....
.....
(2)

Example 2

Communications technology 2
.....
(1)

Method it has replaced
.....
(1)

Benefit of replacement
.....
.....
(2)

Q6

(Total 8 marks)



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7. Handling information and data is an essential feature in mechanical and automotive manufacturing companies.

Explain the benefits information and data handling systems have on:

(a) production efficiency

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(2)

(b) marketing

.....

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.....

(2)

Q7

(Total 4 marks)

TOTAL FOR SECTION A: 45 MARKS



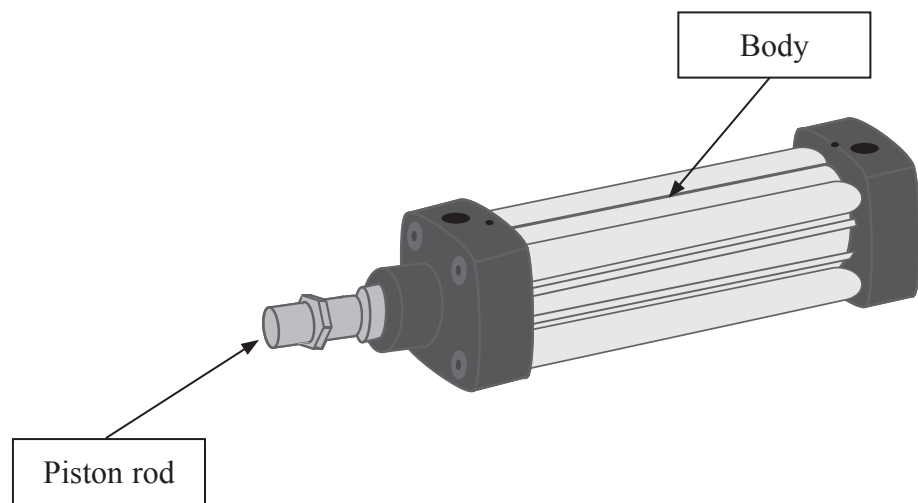
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SECTION B

Answer ALL the questions in this section with reference to the manufacture of mass produced pneumatic cylinders. Write your answers in the spaces provided.

The diagram below shows a pneumatic cylinder.



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

(a) the function of the piston rod

Piston rod

(3)

(b) the function of the body.

Body

(3)

(Total 6 marks)

Q8



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9. (a) The following table indicates the main stages in manufacturing pneumatic cylinders.

Design
Production planning
Materials supply and control
Production
Packaging and dispatch

(i) Write in the table above the **two** missing stages in manufacturing pneumatic cylinders. (2)

(ii) State the stage where the piston rod is machined.

Stage (1)

(b) Describe the following **two** stages in the manufacture of pneumatic cylinders.

(i) Production planning
.....
.....
.....
..... (3)

(ii) Packaging and dispatch
.....
.....
.....
..... (3)

(Total 9 marks)

Q9



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10. (a) Name the specific material commonly used in pneumatic cylinders to make the:

(i) seals on the piston

.....
(1)

(ii) cylinder body.

.....
(1)

(b) Stainless steel can be used in the manufacture of pneumatic cylinders.

(i) State **two** general properties of stainless steel.

1
2
(2)

(ii) State **one** place where stainless steel could be used in the manufacture of the pneumatic cylinder and give reasons why.

Use
Reasons why
.....
(3)

(c) Explain how the use of modern materials has helped the **manufacturer** of pneumatic cylinders develop new products.

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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** of the manufacture of the pneumatic cylinders that utilise monitoring control technology.

(i) Quality control procedure 1

.....
.....

(2)

(ii) Quality control procedure 2

.....
.....

(2)

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

(i) Benefit of procedure 1

.....
.....

(2)

(ii) Benefit of procedure 2

.....
.....

(2)

(Total 12 marks)

Q11



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12. (a) The utilisation of modern technology in the manufacture of pneumatic cylinders has brought changes. Explain these changes in:

(i) the type and size of the workforce

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

(2)

(ii) the working environment

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

(2)

(iii) the global environment

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

(2)



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(b) Describe **one disadvantage** that modern technology has had on the workforce.

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

(c) Describe **one advantage** that modern technology has had on the global environment.

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.....
.....

(2)

(Total 10 marks)

Q12

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13. Computer-aided design (CAD) and Computer-aided manufacture (CAM) are used in the manufacture of pneumatic cylinders.

(a) Describe how CAD is used by the manufacturer to increase market share.

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(4)



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(b) Describe how CAM is used to control manufacturing costs.

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(4)

Q13

(Total 8 marks)

TOTAL FOR SECTION B: 55 MARKS

TOTAL FOR PAPER: 100 MARKS

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