Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						5	3	1	8	/	0	5	Signature	

Paper Reference(s)

5318/05

Edexcel GCSE

Manufacturing (Double Award) (2351)

Engineering (Double Award) (2316)

Unit 3: Application of Technology

Sector 05: Electrical and Electronics, Process Control, Computers, Telecommunications

Monday 2 June 2008 – Morning

Time: 1 hour 30 minutes

Materials required for examination

Notes and sketches collected during your Pre-release research.
Ruler, pen, pencil, rubber.

Items included with question papers

Nil

Examiner's use only

Team Leader's use only

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
Total	

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
You should attempt **ALL** questions in Section A, and **ALL** questions in Section B, using the spaces provided in this paper.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 13 questions in this question paper. The total mark for this paper is 100.
The total mark for Section A is 45, and the total mark for Section B is 55.
There are 20 pages in this question paper. Any blank pages are indicated.

Advice to Candidates

You are reminded of the importance of clear English and careful presentation in your answers.
You may take your researched notes and sketches into the examination room and use these as reference material. **NONE** of this material should be sent to Edexcel and Pre-release work will **not** be marked.

Do not attach your notes and sketches collected during your Pre-release research.

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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 **electrical and electronic** sector.

Products	Tick **two** boxes below
Carbon fibre	
Scissors	
13A plug	
Chilli powder	
Neoprene glove	
MP3 player	

(2)

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

Products	Tick **two** boxes below
Mobile phone	
Walking boots	
Programmable logic controller (PLC)	
Hydraulic pump	
Olive oil	
Assembly robot	

(2)

Q1

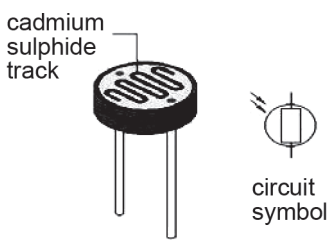
(Total 4 marks)

Leave blank

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

(a) Complete **Table 1** by naming each component.

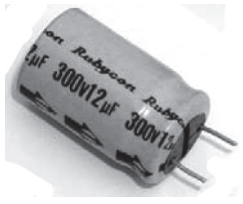
Table 1

Component	Component name	Use
		Converts electrical signals into sound.
		Light energy triggers the release of an extra charge in this material, so that its resistance falls as the level of light increases.

(2)

(b) Complete **Table 2** by explaining what each component is used for.

Table 2

Component	Component name	Use
	Toggle switch	
	Electrolytic capacitor	

(4)

(Total 6 marks)

Q2

Turn over

Leave blank

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
Assembly robot	Information and Communications Technology (ICT)
Silicon	Control technology
Spreadsheet	Modern materials
Acrylic	
Programmable logic controllers (PLCs)	
Word processing	

(1) **(1)** **(1)** **(1)** **(1)** **(1)**

(Total 6 marks)

Q3

Leave blank

4. Soldering iron workstations belong to the electrical and electronics, process control, computers, telecommunications sector.

(a) (i) Name **one** other product from this sector, apart from a **soldering iron workstation**, that utilises in its manufacture a modern material and process control.

.....

(1)

(ii) Explain the purpose of this product.

.....

.....

.....

(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 key features of the product.

.....

.....

.....

.....

(2)

(Total 9 marks)

Q4

Leave blank

5. Information and Communications Technology (ICT) is used by manufacturers of electrical and electronics, process control, computers, telecommunications products.

(a) (i) Give **one** example of **where** a database could be used by a manufacturer.

.....

(1)

(ii) Explain **one** benefit to the manufacturer of using a database relating to this example.

.....

.....

(2)

(b) (i) Give **one** example of communications technology as used by a manufacturer.

.....

(1)

(ii) Explain **one** benefit to the manufacturer of using communications technology relating to this example.

.....

.....

(2)

(c) Explain **one** benefit to the **retailer** of the manufacturer using ICT.

.....

.....

(2) **Q5**

(Total 8 marks)

Leave blank

6. Systems and control technology is now used by manufacturers to organise, monitor and control production.

(a) Name **two** different examples of systems and control technology.

(b) Describe the traditional method each has replaced.

(c) Explain **one** benefit to the manufacturer of using each replacement systems and control technology.

Example 1

Systems and control technology 1 .....

.....

(1)

Method it has replaced .....

.....

(1)

Benefit of replacement .....

.....

.....

(2)

Example 2

Systems and control technology 2 .....

.....

(1)

Method it has replaced .....

.....

(1)

Benefit of replacement .....

.....

.....

(2) **Q6**

(Total 8 marks)

Leave blank

7. Computer-aided manufacture (CAM) is an essential feature in electrical and electronics, process control, computers, telecommunications manufacturing companies.

Explain **one** benefit that CAM has for the:

(a) Manufacturer .....

.....

.....

.....

.....

(2)

(b) Consumer .....

.....

.....

.....

.....

(2) **Q7**

(Total 4 marks)

TOTAL FOR SECTION A: 45 MARKS

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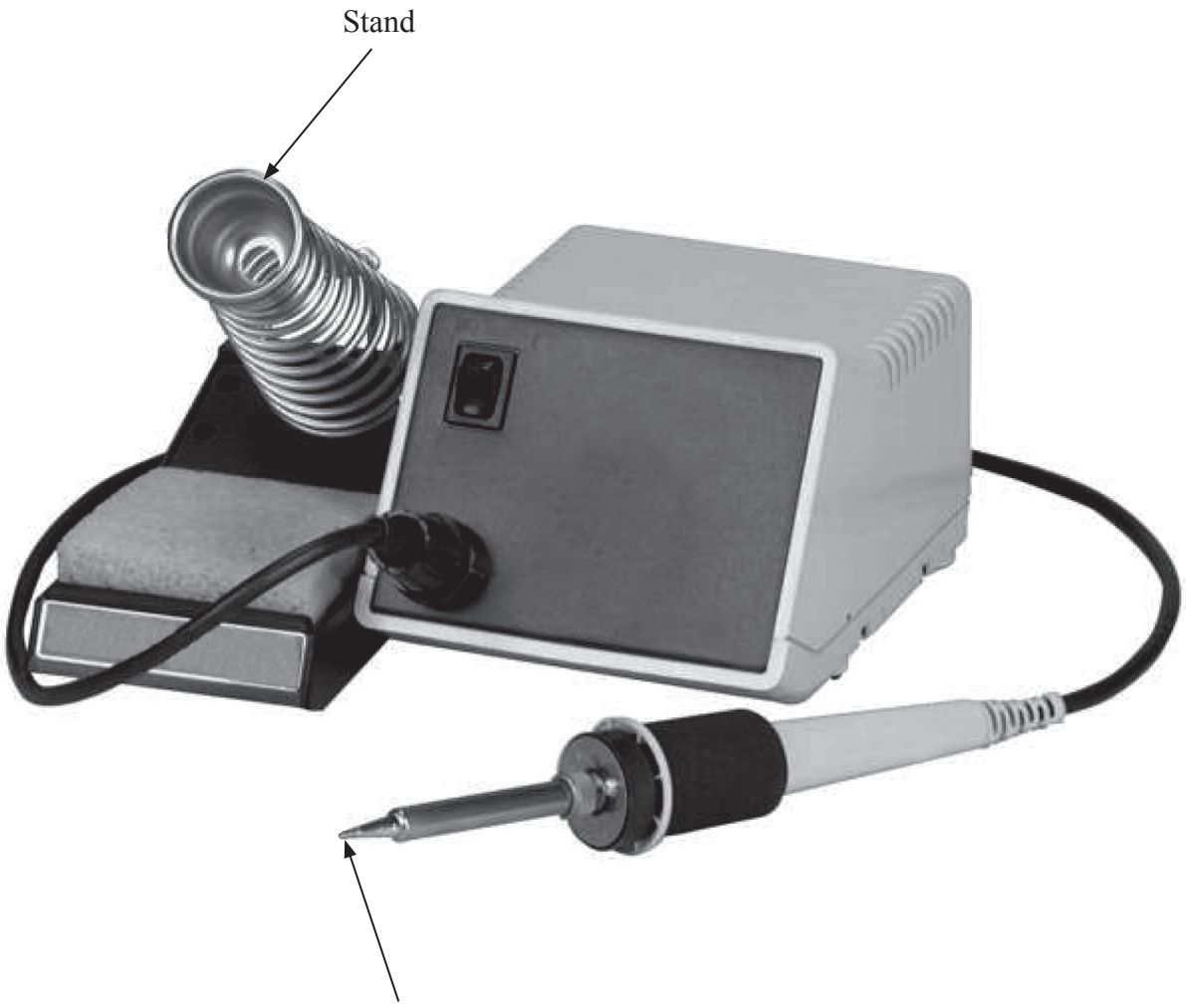
SECTION B

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

The diagram below shows a soldering iron workstation.



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

(a) the function of the soldering iron bit

Soldering iron bit

(3)

(b) the function of the stand.

Stand

(3)

(Total 6 marks)

Q8

Leave blank

9. (a) The following table shows some of the main stages in manufacturing soldering iron workstations.

(i) Complete the table below by giving the **two** missing stages in manufacturing soldering iron workstations.

Stages in manufacturing	
1	
2	Marketing
3	Production planning
4	
5	Production
6	Assembly and finishing
7	Packaging and dispatch

(2)

(ii) State the stage in manufacturing where the soldering iron workstations would be advertised.

Stage .....

(1)

(b) Describe the following **two** stages in the manufacture of soldering iron workstations.

(i) Production .....

.....

.....

.....

.....

(3)

(ii) Assembly and finishing .....

.....

.....

.....

.....

(3)

(Total 9 marks)

Q9

Leave blank

10. (a) Mass produced soldering iron workstations are manufactured using modern materials and features.

(i) Name **one** specific material commonly used in the production of the outer casing of soldering iron workstations.

.....

(1)

(ii) Explain how this material has helped to improve the characteristics of the soldering iron workstation outer casing.

.....

.....

.....

(2)

(b) Thermostatic control is a feature used in soldering iron workstations.

(i) Explain the function of thermostatic control.

.....

.....

.....

(2)

(ii) State **two** safety features, other than thermostatic control, used in soldering iron workstations.

Safety feature 1 .....

Safety feature 2 .....

(2)

(c) Explain how the use of modern materials has helped the **manufacturer** of soldering iron workstations to increase sales.

.....

.....

.....

.....

.....

.....

(3)

(Total 10 marks)

Q10

Leave blank

11. Automation is used in the manufacture of soldering iron workstations.

(a) Describe **two** examples of automation used at the **production** stage of the manufacture of soldering iron workstations.

(b) Explain **one** benefit to the **manufacturer** of applying each type of automation.

(c) Explain **one** benefit to the **consumer** of applying each type of automation.

Example 1

Automation Example 1 .....

.....

.....

(2)

Benefit to manufacturer .....

.....

.....

(2)

Benefit to consumer .....

.....

.....

(2)

Example 2

Automation Example 2 .....

.....

.....

(2)

Benefit to manufacturer .....

.....

.....

(2)

Benefit to consumer .....

.....

.....

(2)

(Total 12 marks)

Q11

Leave blank

12. The use of computer-aided manufacture (CAM) and control technology in the manufacture of soldering iron workstations has brought changes.

(a) (i) State **one** change CAM has had on the type and size of the workforce.

Change .....

(1)

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

Effect 1 .....

.....

(2)

Effect 2 .....

.....

(2)

(b) (i) State **one** change control technology has had on the global environment.

Change .....

(1)

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

Effect 1 .....

.....

(2)

Effect 2 .....

.....

(2)

Q12

(Total 10 marks)

Leave blank

13. Modern materials are used in the manufacture of soldering iron workstations.

(a) Explain how modern materials have impacted environmentally in terms of product disposal.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4)

Leave blank

(b) Explain how the use of modern materials and components has impacted on development costs and product costs.

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4) **Q13**

(Total 8 marks)

TOTAL FOR SECTION B: 55 MARKS

TOTAL FOR PAPER: 100 MARKS

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