Rewarding Learning

71

Candidate Number

General Certificate of Secondary Education
January 2012

Engineering

Paper 1
Assessment Unit 3
assessing
Engineering Technology

[GEE31]

TUESDAY 24 JANUARY, AFTERNOON

GEE31

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all ten** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 80.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total Marks	

Answer **all** questions.

Examiner Only	
Marks	Remark

1 (a) All the products below belong to a manufacturing sector.

Circle **two** products shown below that belong to the mechanical fabrication sector.

You **must** only circle **two** products. If you make a mistake you must clearly show which two products you have chosen.

© iStockphoto / Thinkstock

© The Silverware Shop

© iStockphoto / Thinkstock

© BagsDirect.com

© John Parker & Son Ltd.

© North Area Devon Football

[2]

(b) All the products below belong to a manufacturing sector.

Circle **two** products shown below that belong to the engineering fabrication sector.

You **must** only circle **two** products. If you make a mistake you must clearly show which two products you have chosen.

© Stockbyte / Thinkstock

© Hemera / Thinkstock

© Dorling Kindersley / Thinkstock

© iStockphoto / Thinkstock

© Photodisc / Thinkstock

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[2]

Examiner Only	
Marks	Remark

2 The pictures below show some of the tools and equipment used in the manufacture of products. Complete the table by matching the tool/equipment with its corresponding name. The first one has been done for you.

Tool/Equipment	Name
 © Silverline Tools Ltd	**Pedestal drill**
 © iStockphoto / Thinkstock	**Screw driver**
 © iStockphoto / Thinkstock	**Metal work vice**
 © iStockphoto / Thinkstock	**Scribe**
 © iStockphoto / Thinkstock	**Tap and die set**
 © E C Lyons Co.	**Hacksaw**

[5]

Examiner Only	
Marks	Remark

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(Questions continue overleaf)

Examiner Only	
Marks	Remark

3 **(a)** The pictures below show different types of containers.

Name **one** suitable material which has been used to make each container.

Give **one** reason for each choice.

Container A

© iStockphoto / Thinkstock

Material _____ [1]

Reason

_____

_____

_____ [2]

Container B

© Hemera / Thinkstock

Material _____ [1]

Reason

_____

_____

_____ [2]

Container C

© iStockphoto / Thinkstock

Material _____ [1]

Reason

_____

_____

_____ [2]

(b) Choose any **two** of the following components listed below:–

- Cam
- Diode
- Double acting cylinder
- Rack and pinion gears

Describe its function and where it can be found in an everyday situation.

Component 1

_____

Function

_____

_____

_____ [2]

Where it can be used in an everyday situation.

_____

_____

_____ [1]

Component 2

_____

Function

_____

_____

_____ [2]

Where it can be used in an everyday situation.

_____

_____

_____ [1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

4 A mountain bike such as the one shown below in **Fig. 1** is made up of different mechanical components.

© *Scott Sports SA*

Fig. 1

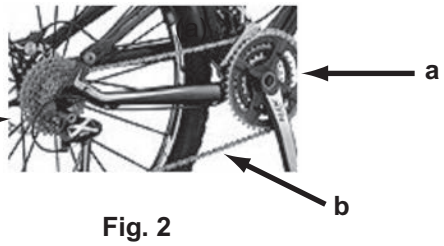

Fig. 2

(a) Name the mechanical components which are shown in **Fig. 2** indicated by **a** and **b**.

_____ [1]

(b) Outline **one** advantage of this mechanism over a drive belt mechanism.

_____

_____ [2]

(c) Identify **one** other mechanism on a mountain bike which requires regular maintenance.

_____

_____ [1]

(d) Describe how the mechanism you have chosen in **4(c)** should be maintained.

_____

_____

_____ [2]

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(Questions continue overleaf)

5 Laminated materials play an important part in society.

Examiner Only	
Marks	Remark

(a) (i) Give **two** reasons why materials are laminated

Reason 1

_____

_____ [2]

Reason 2

_____

_____ [2]

(ii) Plywood is a laminated material. In the box below illustrate how plywood is constructed using sketches.

[2]

(b) Describe any **two** of the mechanical properties listed below.

- Hardness
- Toughness
- Ductility

Mechanical Property 1 _____

Description

_____

_____ [2]

Mechanical Property 2 _____

Description

_____

_____ [2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

6 The handling of materials is a vital part of production planning.

(a) Explain **two** ways in which ICT can make the ordering and moving of materials more efficient.

Explanation 1

_____

_____

_____ [2]

Explanation 2

_____

_____

_____ [2]

(b) Explain **two** ways in which computers are used in the control of materials in an engineering factory.

Explanation 1

_____

_____

_____ [2]

Explanation 2

_____

_____

_____ [2]

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(Questions continue overleaf)

Examiner Only	
Marks	Remark

7 The picture below shows a pillar drill used to manufacture engineered products.

© Draper Tools

(a) What **two** items of personal protective equipment should you wear when operating a pillar drill? Tick (✓) the appropriate box.

- ☐ Goggles
- ☐ Helmet
- ☐ Oven gloves
- ☐ Apron

[2]

(b) Describe **two** safety precautions other than using protective equipment, you should take when operating a pillar drill.

Precaution 1

_____

_____ [2]

Precaution 2

_____

_____ [2]

(c) Quality control checks are carried out when making engineered products.

(i) Name an engineering tool or item that is used to check that a manufactured product is within tolerance of 0.5 mm or smaller.

_____ [1]

(ii) Describe how this tool is used.

_____

_____ [2]

(iii) Describe **one** different quality control check that you could carry out when making an engineered product.

_____

_____ [2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

8 **(a)** Identify **two** benefits to designers when Computer Aided Design (CAD) is used to produce products.

Benefit 1

_____

_____ [2]

Benefit 2

_____

_____ [2]

(b) Describe how Computer Aided Manufacture (CAM) is used to make customised products.

_____

_____ [2]

(c) Describe **one** benefit to the customer when CAM has been used during the manufacture of products.

_____

_____

_____ [2]

Examiner Only	
Marks	Remark

9 **(a)** **(i)** Describe **one** benefit of using modern technology when marketing a product.

_____

_____

_____ [2]

(ii) Describe **one** benefit of using modern technology when packaging a product.

_____

_____

_____ [2]

(iii) Describe **one** benefit of using modern technology when dispatching a completed product.

_____

_____

_____ [2]

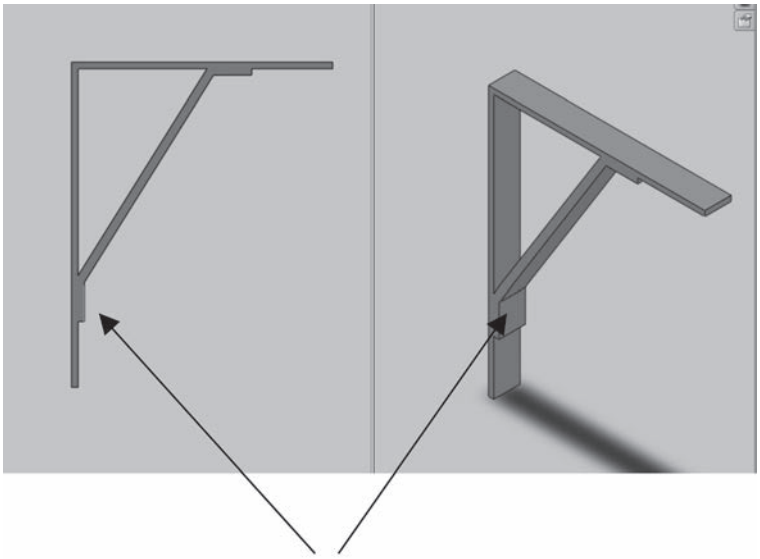
(b) Describe **one** issue to be considered when introducing modern technology into an engineering company.

_____

_____

_____ [2]

10 The engineered mild steel bracket shown below is widely available in shops.



riveted together here

The two mild steel components shown in the diagram are riveted together to complete the wall bracket.

(a) Outline **two** other permanent joints suitable for joining two similar mild steel components.

Example 1

_____

_____ [1]

Example 2

_____

_____ [1]

(b) Outline **one** semi permanent joint suitable for joining two mild steel components.

_____

_____ [1]

Examiner Only	
Marks	Remark

(c) Outline **one** advantage of buying in standard components for the manufacturer.

Examiner Only	
Marks	Remark

_____

_____

_____ [2]

THIS IS THE END OF THE QUESTION PAPER