

Surname	Centre Number	Candidate Number
Other Names		2



**GCE AS/A LEVEL – NEW**

2603U10-1



**DESIGN AND TECHNOLOGY – AS unit 1  
Product Design**

MONDAY, 14 MAY 2018 – AFTERNOON

2 hours

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	8	
2.	8	
3.	8	
4.	8	
5.	8	
6.	40	
<b>Total</b>	<b>80</b>	

**ADDITIONAL MATERIALS**

A calculator, ruler, pencil and coloured pencils.

**INSTRUCTIONS TO CANDIDATES**

Use black ink or black ball-point pen.

Answer **ALL** questions.

Write your name, centre number and candidate number in the spaces at the top of this page.

Write your answers in the spaces provided in this booklet. If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

**INFORMATION FOR CANDIDATES**

The number of marks is given in brackets at the end of each question or part-question. You are advised to divide your time accordingly.

The total number of marks available is 80.

You are reminded of the need for good English and orderly, clear presentation in your answers. The quality of your written communication, including appropriate use of punctuation and grammar, will be assessed in your answer to question 5.

Answer all questions.

1. Computer Aided Design/Computer Aided Manufacture (CAD/CAM) is a common method of designing and manufacturing products used by many companies.

(a) Explain the basic principle used by the **two** CAM machines named below.

(i) Machine: Laser cutter

[2]

Principle: .....  
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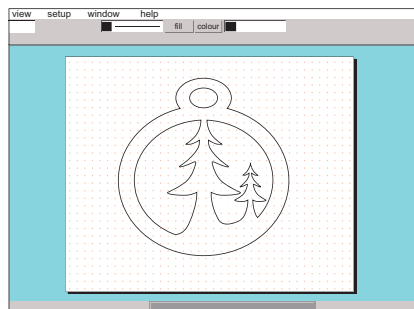
(ii) Machine: 3D printer

[2]

Principle: .....  
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(b) The CAD drawing below shows a proposed design for a wooden hanging decoration. The decoration will be manufactured from 3 mm plywood.

State an appropriate CAM machine for the batch manufacture of this decoration and explain the advantages and disadvantages of your selected machine. [4]



Name of CAM machine: .....

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2. Working in a manufacturing environment can be a hazardous activity and as a result suitable safe working practices must be employed.

(a) Explain the meaning of the sign shown below.

[2]



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(b) Write a detailed risk assessment for a machine or piece of equipment you have used. [6]

Name of machine or piece of equipment: .....

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3. Products are often manufactured from a range of individual components. Study the photographs below of a stackable chair.



(a) State a possible method of manufacture for the seat and shaping the legs.

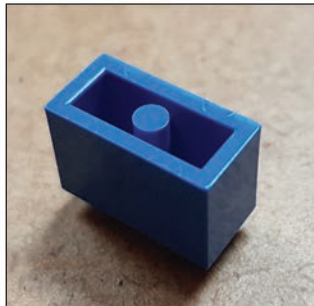
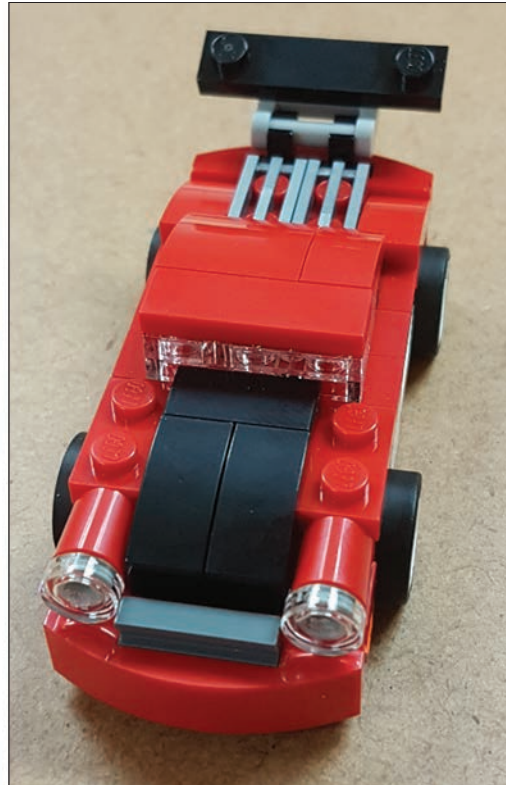
- (i) Seat: ..... [1]
- (ii) Shaping the legs: ..... [1]

- (b) The seat and frame will need to be joined to form a functioning chair. Using notes and sketches explain and justify a suitable fixing method. [6]

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4. Polymers are materials that are widely used in many every day products and toys.



Evaluate the characteristics and physical properties of ABS and rubber that make them suitable for the toy shown in the photographs above. [8]

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- 5. The phrase 'Form follows Function' has become the belief of many designers in the 20<sup>th</sup> and 21<sup>st</sup> century.

Discuss this statement with reference to the work of James Dyson. [8]

*Marks will be awarded for content of the answer and the quality of written communication.*

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6. Household appliances often reflect the audience they have been designed for. Study the images below.

Telephone A



Telephone B





- (a) The starting point for a designer is a product analysis. Write a critical analysis of **one** of the products pictured and justify each observation. [8]

Telephone: .....

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**Problem**

It is important that independent visually impaired persons have access to stylish modern household equipment. A land line phone is important for easy communication and must be easy to operate.

**Design Brief**

You are asked to design the hand set only for a stand-alone land line phone that is modern in style. The hand set must allow the user to quickly distinguish the mouth piece from the ear piece.

- (b) Write **four** fully justified specification points that will ensure the requirements of the user are met. [8]

Point 1: .....

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Point 2: .....

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Point 3: .....

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Point 4: .....

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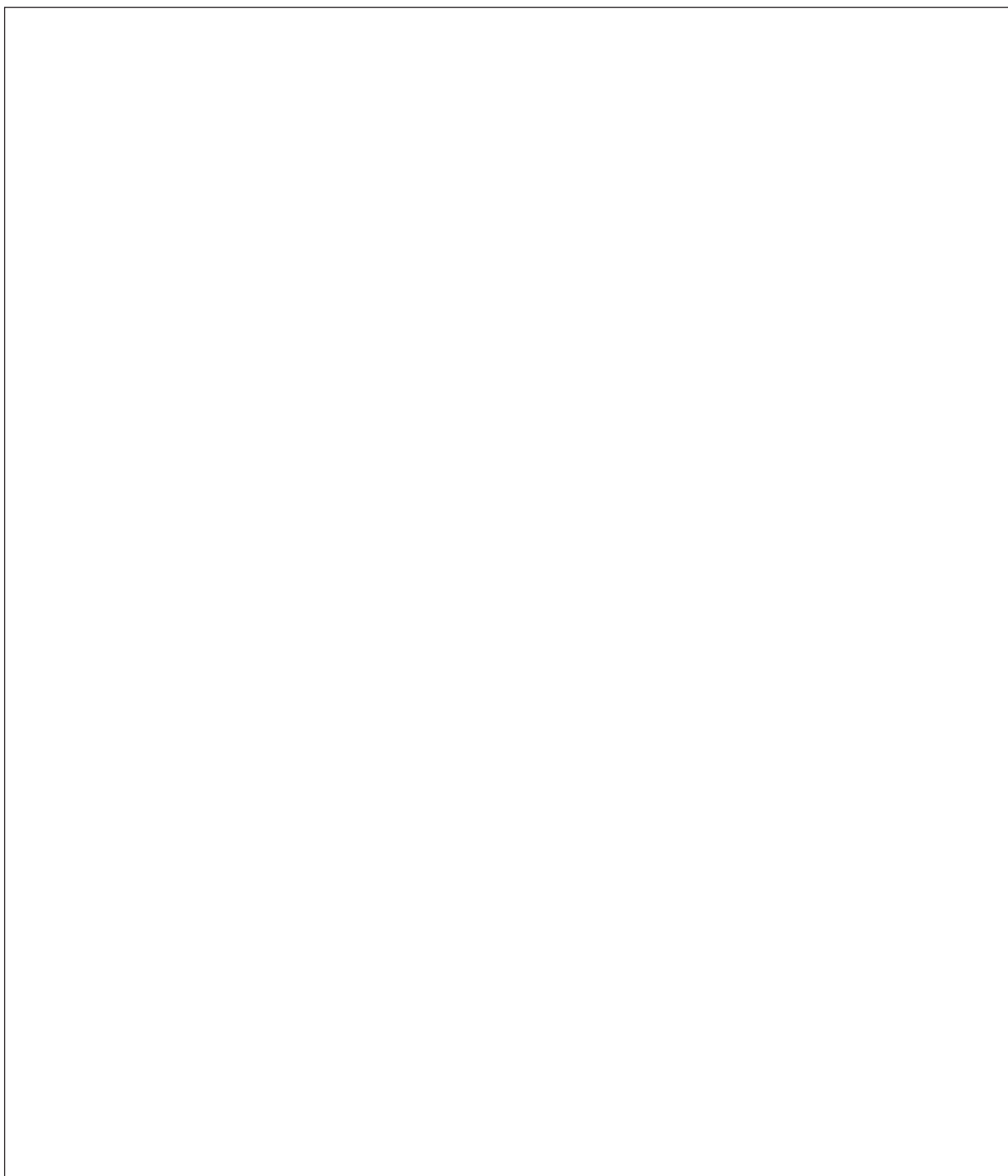
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- (c) In the space provided produce a possible design for the handset. You are required to use a combination of 2D and 3D freehand drawings.

Marks will be awarded for:

- (i) An annotated design proposed that displays evidence of your consideration of user interface, function and style. [8]
- (ii) Labelling and justifying the use of materials in your design. [4]
- (iii) The quality/presentation and communication of your 2D/3D drawings. [4]  
***You are not expected to render, colour or shade your design work.***



(d) Justify how your design meets the four points indicated in your design specification. [8]

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**END OF PAPER**

**For continuation only.**

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