

Surname	Centre Number	Candidate Number
First name(s)		4



LEVEL 1 / LEVEL 2 AWARD



9793/01

THURSDAY, 26 MAY 2022 – MORNING

ENGINEERING – Unit 3 Solving Engineering Problems (VOCATIONAL)

1 hour 30 minutes

Suitable for Modified Language Candidates

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	24	
2.	16	
3.	20	
Total	60	

ADDITIONAL MATERIALS

In addition to this paper you may require a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

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

Answer **all** questions.

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

INFORMATION FOR CANDIDATES

The total number of marks for this paper is 60.

The number of marks is given in brackets at the end of each question or part-question.

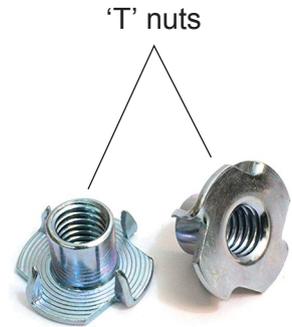
You are reminded of the necessity for good English and orderly presentation in your answers.



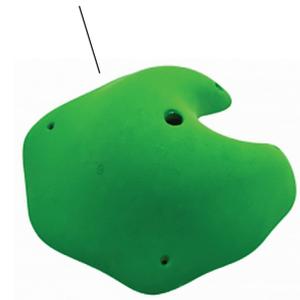
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Answer **all** questions in the spaces provided.

1. Look at the images below. They show a range of indoor climbing walls, fixtures and fittings.



Hand holds/grips



Climbing blocks

- (a) Complete the table below. Give reasons for the material used for the named parts.

2 × [1]

Named parts	Material	Reason for choice
'T' nuts	Stainless steel
Hand holds/grips	Polyurethane



- (b) Look at the climbing blocks in the first picture. They have been manufactured by a plastic moulding process.

Describe **two** advantages of using a plastic moulding process to manufacture the blocks. [4]

Advantage 1:

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Advantage 2:

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.....

- (c) Some advanced climbing walls have hand holds/grips. These are to assist and increase the difficulty to the user.

When designing the hand holds/grips. Write **three** detailed specification points that the design engineer would consider. [3]

Specification point 1:

.....

.....

Specification point 2:

.....

.....

Specification point 3:

.....

.....

- (d) Complete the table below. When manufacturing the climbing wall. Give the correct classification for **each** named material used. 3 × [1]
 Note: The first material has been completed.

Material	Classification
Mild steel	Ferrous
Acrylic
Polyester resin
Aluminium



(e) The climbing walls are assembled using nuts and bolts. Explain how you would cut an external M8 thread on an 8 mm diameter mild steel bar. Use notes and diagrams. [6]

(f) The climbing wall must be thoroughly tested for safety purposes. Explain the difference between a destructive and a non-destructive test. [2]

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(g) The climbing wall uses different forms of fixtures and fittings for all parts of its construction. Explain the difference between a temporary and a permanent fixing method. Use examples. [4]

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2. The world of engineering is greatly influenced by developments in technology.

Look at the pictures below. They show two different types of attachment to a mobile phone.



(a) There has been a need for the products shown above. Describe **two** technological advances in the development of mobile phones that have created this need. [4]

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(b) Discuss **one** disadvantage to the user of having one of these products attached to a phone. [2]

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(c) The development of mobile phone technology has supported engineers in global manufacturing. Explain how. [2]

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(d) Discuss the environmental issues that might occur when disposing of mobile phones. [4]

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(e) The British Standards Institution (BSI) plays an important role when approving products. Describe the importance of the BSI when approving products like the mobile phone before going on sale to the general public. [4]

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3. Shown below are two pieces of equipment used in an engineering workshop.

(a) (i) Complete the table below. Correctly write a description of its use. 2 × [1]

Engineering equipment	Equipment name	Equipment use
	Centre Punch	<p>.....</p> <p>.....</p>
	Outside Callipers	<p>.....</p> <p>.....</p>

(ii) State **three** safety precautions you should apply before you use a milling machine. 3 × [1]

Precaution 1:

Precaution 2:

Precaution 3:

(iii) Name **two** measuring tools that are used for quality control. Describe how they are used. 2 × [2]

Measuring tool 1:

Description:

.....

Measuring tool 2:

Description:

.....



- (b) This is a picture of a small brass pin tag.



Description of brass tag:

100 mm × 30 mm wide.

Thickness of the material is 3 mm.

Both drilled holes are 3 mm diameter.

- (i) Complete the third angle orthographic drawing. Produce a fully functioning **working** drawing. Show all required features and details.

[6]



(ii) Calculate the total volume of the brass tag after it has been manufactured. [5]

Show all your calculations.

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