CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

19 MAY 2021 (a.m.)

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FILL IN ALL THE INFORMATION REQUESTED CLEARLY IN CAPITAL LETTERS.

TEST CODE | 0 | 1 | 3 | 7 | 4 | 0 | 2 | 0 |

SUBJECT INDUSTRIAL TECHNOLOGY
OPTION C – BUILDING AND FURNITURE TECHNOLOGY – Paper 02

PROFICIENCY TECHNICAL

REGISTRATION NUMBER | | | | | | | | | | |

SCHOOL/CENTRE NUMBER					

NAME OF SCHOOL/CENTRE

CANDIDATE'S FULL NAME (FIRST, MIDDLE, LAST)

DATE OF BIRTH | D | D | M | M | Y | Y | Y | Y |

SIGNATURE _____

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FORM TP 2021085

TEST CODE 01374020

MAY/JUNE 2021

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

INDUSTRIAL TECHNOLOGY

OPTION C – BUILDING AND FURNITURE TECHNOLOGY

Paper 02 – Technical Proficiency

2 hours 10 minutes

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of FIVE compulsory questions.
2. Use sketches where necessary to support your answers.
3. Write your answers in the spaces provided in this booklet.
4. Do NOT write in the margins.
5. You may use a silent, non-programmable calculator to answer questions.
6. This paper contains metric dimensions only. You should work your answers in the metric system.
7. If you need to rewrite any answer and there is not enough space to do so on the original page, you must use the extra lined page(s) provided at the back of this booklet. **Remember to draw a line through your original answer.**
8. **If you use the extra page(s) you MUST write the question number clearly in the box provided at the top of the extra page(s) and, where relevant, include the question part beside the answer.**

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

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0 1 3 7 4 0 2 0 0 3

1. Figure 1 shows a concrete footing that is to be constructed to support a foundation wall of a building. The concrete footing is to be 7620 mm long, 609 mm wide and 203 mm thick. An appropriate steel mat is to be constructed to reinforce the concrete.

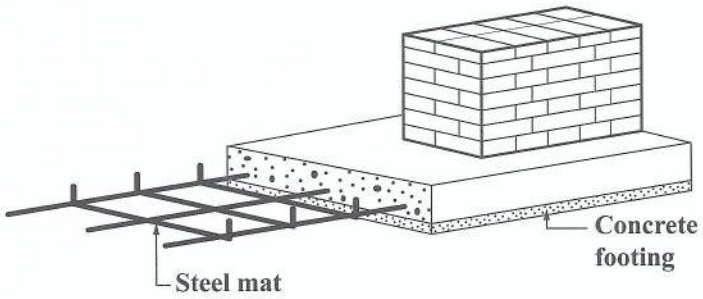


Figure 1. Concrete footing with steel mat

(a) (i) Determine the dimensions of the steel mat that should be built in order to allow for 38 mm concrete coverage at all ends. Show all working.

Length =.....

Width = ...

(3 marks)

GO ON TO THE NEXT PAGE

(ii) Outline the steps, in **sequential order,** for constructing a simple steel mat for a footing area.

.....

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(3 marks)

(b) State TWO components of the built environment.

.....

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(2 marks)

(c) Suggest TWO reasons for the decrease in soil quality in the Caribbean region.

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(2 marks)

GO ON TO THE NEXT PAGE

(d) Explain the functions of EACH of the following aggregates in a concrete mix.

Cement .....

.....

.....

Sand .....

.....

.....

Stone .....

.....

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(6 marks)

(e) State TWO types of concrete.

.....

.....

(2 marks)

Total 18 marks

2. Figure 2 shows the layout of a building foundation.

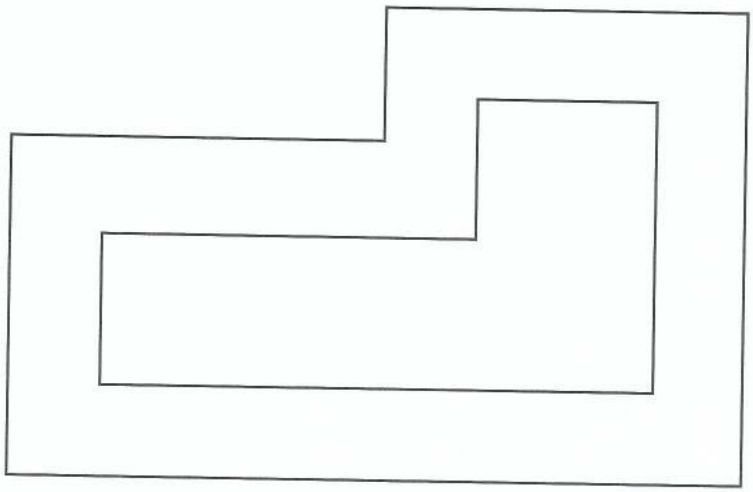


Figure 2. Building foundation layout

(a) List SIX tools that could be used for laying out the building foundation shown in Figure 2.

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(6 marks)

(b) On Figure 2, make neat, labelled sketches to show the position of EACH of the following.

(i) Batten boards

(ii) Corner profile boards

(iii) Trench lines

(6 marks)

(c) With the aid of labelled drawings, show TWO methods of squaring the corners of the building layout.

(6 marks)

Total 18 marks

GO ON TO THE NEXT PAGE

3. (a) Trees are classified into two groups. In the table below, place a tick (✓) under the appropriate heading to indicate the group to which EACH of the trees belongs.

Tree	Hardwood	Softwood
Mahogany		
Cedar		
Pine		
Birch		

(4 marks)

(b) Figure 3 shows the cross-section of a tree trunk with its parts labelled D and E. Name the TWO labelled parts.

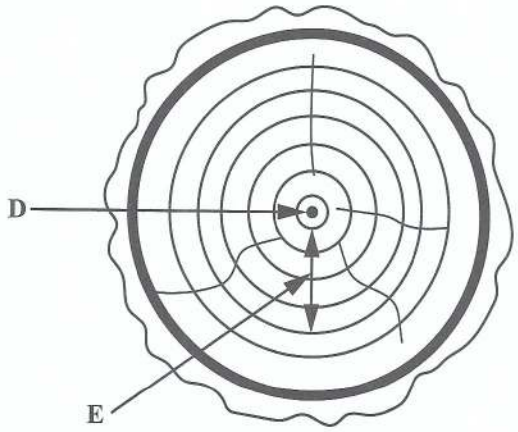


Figure 3. Cross-section of a tree trunk

D .....

E .....

(2 marks)

(c) Figure 4 shows a timber log which is to be converted into several boards for a timber floor structure using the plain sawing method.

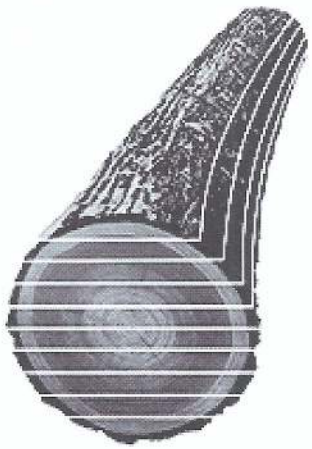


Figure 4. Timber log

(i) Suggest TWO advantages of plain sawing.

.....

.....

(2 marks)

(ii) Suggest ONE disadvantage of any **other** method of timber conversion.

.....

.....

(1 mark)

(d) On a building site, structural timber can be affected by distortion, vegetation growth, severe weather and poor air circulation. Outline, in **sequential order**, THREE steps that should be taken to store structural timber on a building site.

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(6 marks)

(e) Calculate the moisture content for a sample of wood which weighed 29.5 grams when wet and 25.6 grams when dried.

Note: You are required to state the formula and show all working.

Moisture content = ...

(3 marks)

Total 18 marks

4. Figure 5 shows the ground floor plan of a residential building. A hip roof is to be constructed for the building.

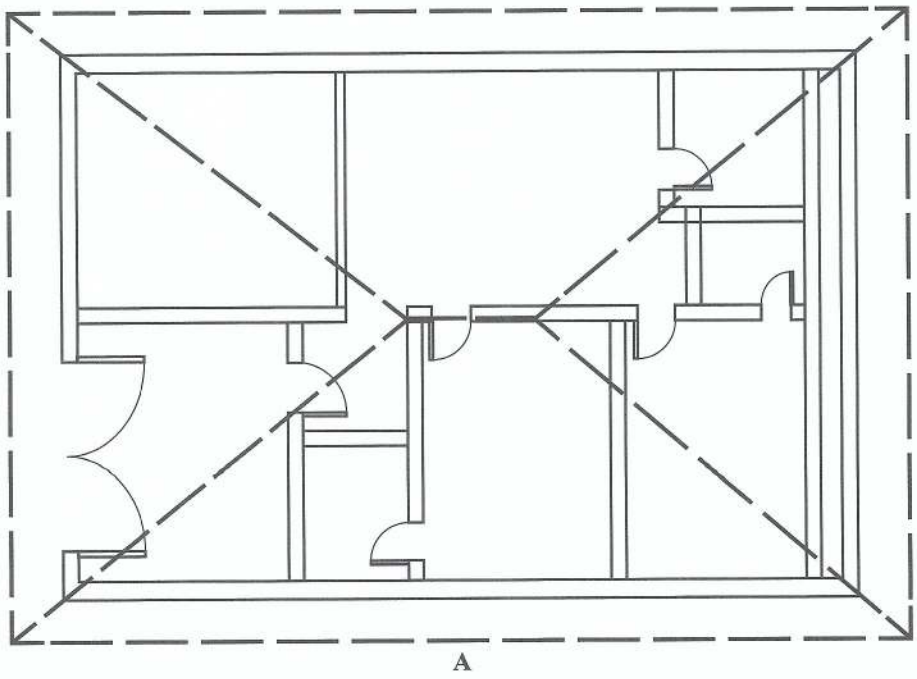


Figure 5. Ground floor plan of residential building

(a) Make a neat sketch to show the side elevation of the roof, labelled A, in Figure 5.

(1 mark)

GO ON TO THE NEXT PAGE

0 1 3 7 4 0 2 0 1 2

(b) Produce a labelled line diagram (plan view) of the hip roof in Figure 5 **on page 12**. Number, **in sequential order**, the first THREE roof members that should be installed.

(5 marks)

(c) (i) State TWO functions of EACH of the following building elements as indicated on the floor plan in Figure 5 **on page 12**.

Door

.....

.....

Roof

.....

.....

(4 marks)

(ii) Suggest TWO advantages of using trusses.

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(2 marks)

(d) (i) List THREE types of roof covering materials.

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.....

.....

(3 marks)

(ii) List THREE types of building foundations.

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(3 marks)

Total 18 marks

GO ON TO THE NEXT PAGE

NOTHING HAS BEEN OMITTED.

5. Figure 6 shows a free-standing bookrack made of pitch pine.

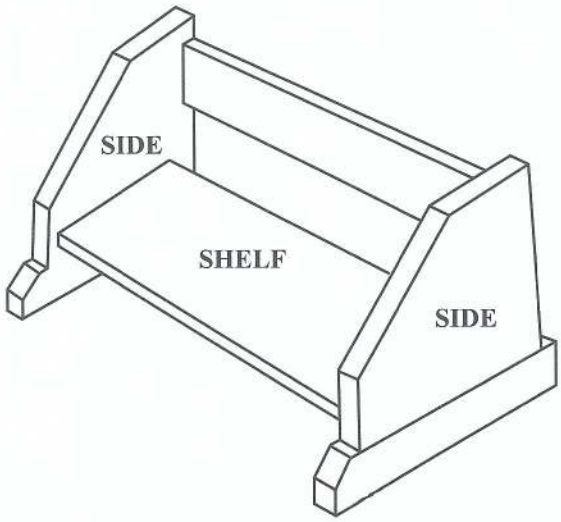


Figure 6. Free-standing bookrack

(a) List FOUR hand tools which can be used when constructing a bookrack.

.....

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(4 marks)

(b) List THREE joints that can be used to connect the shelf to the sides of the bookrack in Figure 6.

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(3 marks)

GO ON TO THE NEXT PAGE

(c) Outline THREE sequential steps for constructing the bookrack in Figure 6 **on page 16**.

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(6 marks)

(d) (i) State TWO types of wood finishes (chemical and other applications).

.....

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(2 marks)

(ii) Suggest THREE benefits of sealing wood grain when finishing a timber product.

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(3 marks)

Total 18 marks

END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.

EXTRA SPACE

If you use this extra page, you MUST write the question number clearly in the box provided.

Question No. ☐

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CANDIDATE'S RECEIPT

INSTRUCTIONS TO CANDIDATE:

1. **Fill in all the information requested clearly in capital letters.**

TEST CODE: | 0 | 1 | 3 | 7 | 4 | 0 | 2 | 0 |

SUBJECT: INDUSTRIAL TECHNOLOGY
OPTION C – BUILDING AND FURNITURE TECHNOLOGY – Paper 02

PROFICIENCY: TECHNICAL

REGISTRATION NUMBER: | | | | | | | | | | |

FULL NAME: _____
(BLOCK LETTERS)

Signature: _____

Date: _____

2. **Ensure that this slip is detached by the Supervisor or Invigilator and given to you when you hand in this booklet.**

3. **Keep it in a safe place until you have received your results.**

INSTRUCTION TO SUPERVISOR/INVIGILATOR:

Sign the declaration below, detach this slip and hand it to the candidate as his/her receipt for this booklet collected by you.

I hereby acknowledge receipt of the candidate's booklet for the examination stated above.

Signature: _____
Supervisor/Invigilator

Date: _____

