

Monday 10 January 2022 – Afternoon

Level 3 Cambridge Technical in Engineering

05822/05823/05824/05825/05873 Unit 1: Mathematics for engineering

Time allowed: 1 hour 30 minutes
C301/2201



You must have:

- the Formula Booklet for Level 3 Cambridge Technical in Engineering (inside this document)
- a ruler (cm/mm)
- a scientific calculator



Please write clearly in black ink.

Centre number

Candidate number

First name(s) _____

Last name _____

Date of birth

INSTRUCTIONS

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.
- Answer **all** the questions.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.
- Give your final answers to a degree of accuracy that is appropriate to the context.

INFORMATION

- The total mark for this paper is **60**.
- The marks for each question are shown in brackets [].
- This document has **12** pages.

ADVICE

- Read each question carefully before you start your answer.

| FOR EXAMINER USE ONLY | |
|-----------------------|------------|
| Question No | Mark |
| 1 | /11 |
| 2 | /8 |
| 3 | /9 |
| 4 | /8 |
| 5 | /6 |
| 6 | /9 |
| 7 | /9 |
| Total | /60 |

Answer **all** the questions.

1

- (a) Remove the brackets and simplify $(3x - 1) - 2(1 - x)$.

.....
.....
..... [2]

- (b) Factorise $4x + 6xy$.

.....
..... [2]

- (c) Express as a single fraction $\frac{x}{2} + \frac{2x}{3}$.

.....
.....
..... [2]

- (d) Solve the equation $2x - 1 = 3 + 5x$.

.....
.....
..... [2]

- (e) Rearrange $s = vt - \frac{1}{2}at^2$ to make v the subject.

.....
.....
..... [3]

2

- (a) Use the quadratic formula to solve the equation $x^2 + 3x - 7 = 0$.

Give your answers correct to 3 significant figures.

.....

.....

.....

..... [3]

- (b) An engineer is buying electrical components that are made in two types, type A and type B.

3 of type A and 4 of type B will cost £39.

4 of type A and 3 of type B will cost £38.

Let the cost of a type A be £ a and the cost of a type B be £ b .

Form two equations in a and b and solve simultaneously to find the cost of each type.

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.....

.....

..... [5]



Oxford Cambridge and RSA

Monday 10 January 2022 – Morning

Level 3 Cambridge Technical in IT

05838/05839/05840/05841/05842/05877 Unit 1: Fundamentals of IT

Time allowed: 1 hour 30 minutes
C380/2201



You must have:

- a calculator



Please write clearly in black ink.

Centre number

Candidate number

First name(s) _____

Last name _____

Date of birth

INSTRUCTIONS

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.
- Answer **all** the questions.

INFORMATION

- The total mark for this paper is **80**.
- The marks for each question are shown in brackets [].
- Quality of extended response will be assessed in questions marked with an asterisk (*).
- This document has **16** pages.

ADVICE

- Read each question carefully before you start your answer.

| FOR EXAMINER USE ONLY | |
|-----------------------|------------|
| Question No | Mark |
| Section A: 1-15 | /15 |
| Section B: 16 | /7 |
| 17 | /5 |
| 18 | /10 |
| 19 | /13 |
| 20 | /9 |
| 21 | /19 |
| 22 | /2 |
| Total | /80 |

SECTION A

Answer **all** the questions.

Put a tick (✓) in the box next to the **one** correct answer for each question.

1 Which of the following is a characteristic of an embedded computer system?

A Able to carry out a wide range of tasks

B Can be upgraded by a user

C Contains a complex user interface

D Low power consumption

[1]

2 Which hardware is needed to connect a tablet computer to the internet?

A NIC

B Router

C Server

D Wireless Access Point (WAP)

[1]

3 Which of the following is a development tool?

A CAD/CAM

B Compiler

C Project Management

D Spreadsheet

[1]

4 Which of the following is a benefit of off-the-shelf software?

A Available immediately

B Free

C Has lots of extra features

D Requires an annual fee

[1]

5 Which communication method allows real-time internet chat conversations?

A Email

B Instant messaging

C Short Messaging Service

D Voice over Internet Protocol

[1]

6 FTP stands for:

A Fast Transfer Protocol

B File Transfer Protocol

C File Translation Protocol

D Final Transistor Position

[1]