# AQA

# Level 3 Technical Level

## IT: CYBER SECURITY
## IT: NETWORKING
## IT: PROGRAMMING
## IT: USER SUPPORT
Unit 1 Fundamental principles of computing

Monday 15 January 2018          Morning          Time allowed: 2 hours

**Materials**
For this paper you must have:
- a ruler.

**You may use:**
- a calculator
- stencils or other drawing equipment (eg flowchart stencils).

**Instructions**
- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- If you need more space use the additional pages at the back of this booklet.

**Information**
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80. There are 50 marks in **Section A** and 30 marks in **Section B**.
- Both sections should be attempted.

**Advice**
- In all calculations, show clearly how you work out your answer.
- Use diagrams, where appropriate, to clarify your answers.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

| For Examiner's Use | |
|---|---|
| Examiner's Initials | |
| Question | Mark |
| 1 | |
| 2 | |
| 3 | |
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| 14 | |
| 15 | |
| 16 | |
| TOTAL | |

## Section A

Answer **all** questions in this section.

**Total for this section: 50 marks**

In the multiple choice questions, only **one** answer per question is allowed.

For each question completely fill in the circle alongside the appropriate answer.

CORRECT METHOD  ⬤  WRONG METHODS  ⊗  ⊙  ⊜  ✓

If you want to change your answer you must cross out your original answer as shown.  ⊠

If you wish to return to an answer previously crossed out, ring the answer you now wish to select as shown.  ⊗

| 0 | 1 |
|---|---|

A device driver acts as a translator between hardware and

**A**   other hardware.   ◯

**B**   software programs.   ◯

**C**   the system bus.   ◯

**D**   the user.   ◯

**[1 mark]**

1

| 0 | 2 |
|---|---|

Which of these types of software is defined as 'the original source code is made freely available and may be redistributed and modified'?

**A**   Freeware.   ◯

**B**   Open source software.   ◯

**C**   Shareware.   ◯

**D**   System software.   ◯

**[1 mark]**

1

**0 3** **One** function of an operating system is to

A   allocate user names.   ○

B   capture inputs.   ○

C   correct grammar errors.   ○

D   track files.   ○

**[1 mark]**

1

**0 4** For the outcome of a logical AND expression to be TRUE, which of the following is correct?

A   All inputs have to be FALSE.   ○

B   All inputs have to be TRUE.   ○

C   At least one input has to be FALSE.   ○

D   At least one input has to be TRUE.   ○

**[1 mark]**

1

**0 5** Select the answer which gives the correct result for this arithmetic operation.

20 − (27 / 3) * 2 + 2

A   −16   ○

B    4   ○

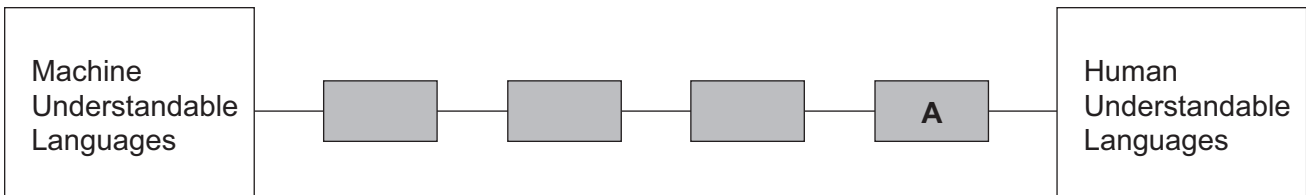C   20   ○

D   24   ○

**[1 mark]**

1

**Turn over ▶**

| 0 | 6 | Programming languages can be grouped into different categories according to how close they are to machine language or human understandable language.

Write the corresponding letter for each type of programming language listed in the correct box on the line below. One has been done for you.

**A**  4GLs

**B**  Assemblers

**C**  High level languages

**D**  Machine code

**[3 marks]**

| Machine Understandable Languages |  |  |  | A | Human Understandable Languages |

| 0 | 7 | . | 1 | Describe what main memory does.

**[3 marks]**

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| 0 | 7 | . | 2 | How does the Central Processing Unit (CPU) communicate with the main memory?

**[1 marks]**

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3

4

**0 8** A Graphical User Interface (GUI) and a Command Line Interface (CLI) both allow computer users to interact with computer systems.

Compare and contrast the two interfaces with reference to the user experience.

**[6 marks]**

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**6**

**Turn over for the next question**

**Turn over ▶**

| 0 | 9 | . | 1 | State what actions occur in the Input-Process-Output cycle when accessing a website using a web browser.

**[3 marks]**

INPUT _____

_____

PROCESS _____

_____

OUTPUT _____

_____

| 0 | 9 | . | 2 | Describe **one** way the input phase and **one** way the output phase of the cycle could be adapted for a visually impaired person.

**[4 marks]**

Input Phase Adaptation _____

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Output Phase Adaptation _____

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7

| 1 | 0 |

The owner of a small newsagent's shop, which also delivers papers, has asked for your help with choosing a new computer system for the shop.

| 1 | 0 | . | 1 |

Suggest **two** questions you would ask to help you determine the best choice of computer system. Explain why you would ask each question.

**[4 marks]**

Question 1 _____

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Reason 1 _____

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Question 2 _____

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Reason 2 _____

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| 1 | 0 | . | 2 |

Summarise the advantages and disadvantages of recommending a tablet, a laptop or a desktop PC.

**[6 marks]**

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**Turn over ▶**

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**1 0 . 3** Describe **two** security measures you would put in place on the chosen system.

**[4 marks]**

Measure 1: _____
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Measure 2: _____
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**10** . **4**  The system that you have recommended will eventually reach the end of its useful life. At this point it is important that it is disposed of correctly.

Describe measures that should be taken to ensure that disposal complies with relevant legislation.

**[3 marks]**

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**17**

**11**  State one graphical method of conveying information to the user of a computer system.

**[1 mark]**

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**1**

**Turn over ▶**

G/Jan18/Y/507/6424

| 1 | 2 |
|---|---|

The following truth table shows the logic for an intruder alarm system with three inputs.

**Table 1**

| A | B | C | S |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 |

Input **A** is a pressure mat on the floor.
Input **B** is a movement sensor.
Input **C** is a magnetic catch on a window.
Output **S** is an audible alarm.

From the values in the **Table 1** write **one** sentence that logically states what will cause the alarm to sound.

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**1 3** What function does a power supply unit perform and why is it needed?

**[3 marks]**

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**3**

**1 4** Explain why it is sometimes necessary to install expansion cards, such as a graphics card, in a computer.

**[3 marks]**

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**3**

**Turn over ▶**

## Section B

Answer **both** questions in this section

**Total for this section: 30 marks**

| 1 | 5 | An organisation has installed off-the-shelf systems management software on their network.

| 1 | 5 | . | 1 | A software inventory is included as part of the systems management software. List the expected contents of the inventory and explain its role in managing software assets.

**[9 marks]**

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**1 5 . 2** Describe **two** tasks **other than software inventory** that this software might carry out.

**[4 marks]**

Task 1 _____

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Task 2 _____

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**15 . 3** The off-the-shelf software requires customisation in order to meet the organisation's needs better.

What is this type of software called?

[1 mark]

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**15 . 4** Discuss the advantages and disadvantages to the organisation of customising the software in this way.

[6 marks]

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**1 6** 'Citizen Science' uses the power of many people working together to collect or analyse huge data sets. These projects might record and analyse wildlife numbers or analyse images from radio telescopes to map the stars. Hundreds of thousands of people might take part in each project. Overall the project is supervised by professional scientists.

Citizen science projects have a genuine science outcome.

**1 6 . 1** Describe how computer systems enable large numbers of volunteers to collaborate on citizen science projects.

**[6 marks]**

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**16** . **2**  Describe **two** characteristics of information that might affect the quality of the results of a citizen science project.

**[4 marks]**

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**10**

**END OF QUESTIONS**

If needed, use the following pages to continue your answers.  Write the question number beside your answer.

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