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OCR
Oxford Cambridge and RSA

A LEVEL

Examiners' report

COMPUTER SCIENCE

H446

For first teaching in 2015

H446/01 Summer 2024 series

Version 1

Contents

Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates.

The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions and highlight good performance and where performance could be improved. A selection of candidate answers is also provided. The reports will also explain aspects which caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

Where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.

A full copy of the question paper and the mark scheme can be downloaded from OCR.

Paper 1 series overview

H446/01 (Computer Systems) is one of two examined components for the GCE A Level Computer Science.

This component focuses on:

- the characteristics of contemporary processors, input, output and storage devices
- software and software development
- exchanging data
- data types, data structures and algorithms
- legal, moral, cultural and ethical issues.

To do well on this paper, candidates need to be able to demonstrate and apply knowledge across all of the topics listed above in different contexts.

It is important that candidates apply their knowledge to the question where a scenario or data is provided. Definitions were at times not clearly expressed and key terms not used. Candidates were able to access the full range of marks across the paper and it was good to see how many candidates were able to gain full marks on the binary and hexadecimal questions.

Candidates who did well on this paper generally:	Candidates who did less well on this paper generally:
• had a good understanding of Search Engine Indexing and Page Rank • applied their knowledge well to the different scenarios, in particular Question 2 (e) and Question 7 • were able to use key terms effectively • had good knowledge of application types and were able to recommend a suitable application for a given purpose • had good knowledge of the FDE cycle and pipelining.	• had little knowledge of Search Engine Indexing or Page Rank • did not use correct terminology • were unable to apply knowledge to scenario • gave vague responses which did not address the question • were unable to use correct database terminology.

Question 1 (a)

1 The stored program concept uses the Fetch-Decode-Execute cycle to get the next instruction from memory and then execute it.

(a) Describe what happens during the **fetch** stage of the Fetch-Decode-Execute cycle.

You should state the different registers and buses that are used in your answer.

.....

.....

.....

.....

.....

..... **[4]**

Candidates who had good knowledge of the FDE cycle were able to gain 3 or 4 marks on this question. Some candidates did not have a good understanding of what a register or a bus is and tended to say they did something other than transport or temporarily store. Many however gave clear and correct responses.

Misconception

Some candidates gave responses which mentioned a register fetching the data or passing data. A register is a temporary store for data/instructions/addresses and as such doesn't fetch or pass anything.

Exemplar 1

The PC holds the next instruction's address which is copied to the ~~RAM~~ MAR, memory address register. The Program Counter is incremented. The address from the MAR is sent on the address bus to ~~the~~ the memory. Simultaneously a fetch/read signal is sent on the control bus by the control unit. The data or instruction goes on the data bus and is copied into the Memory Data Register. It is then copied into the CIR [4]

This candidate has shown a clear understanding of the role of the buses and registers in the fetch part of the FDE cycle.

Question 1 (b)

(b) One of the instructions that may be fetched and executed as part of this cycle is a branch instruction.

State the name of the register that would be altered in the **execute** phase during a branch instruction.

..... **[1]**

Candidates who understood the FDE cycle gained the mark. Those that did not tended to mention a register used in the fetch or decode stages.

Question 1 (c)

(c) Three ways of improving the performance of a CPU are increasing the clock speed, adding more cores and using pipelining.

Explain how pipelining improves the performance of a CPU.

.....

.....

.....

.....

.....

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

Many candidates were able to gain a mark for an instruction being fetched at the same time as another is decoded. Some candidates discussed multiple cores which were mentioned in the question stem but did not apply to this question. Candidates should have access to previous mark schemes.

Question 1 (d) (i)

(d) The Fibonacci sequence is a series of numbers. It starts with the number 0 and then 1. Each number after that is a sum of the two numbers before it.

The first seven numbers in the series are:

0
1
1 (i.e. 1 + 0)
2 (i.e. 1 + 1)
3 (i.e. 1 + 2)
5 (i.e. 2 + 3)
8 (i.e. 3 + 5)

Orla has written some code to show the first five numbers in the Fibonacci sequence (0,1,1,2,3) using the Little Man Computer (LMC) instruction set.

The LMC code that Orla has written contains an error.

```
START    LDA   MAX
         BRZ   END
         LDA   A
         OUT
         ADD   B
         STA   B
         LDA   B
         STA   A
         LDA   MAX
         SUB   ONE
         STA   MAX
         BRA   START
END      HLT
A        DAT   0
B        DAT   1
MAX      DAT   5
ONE      DAT   1
```

(i) State the **five** outputs that Orla's code would give.

Output 1 .....

Output 2 .....

Output 3 .....

Output 4 .....

Output 5 .....

[3]

Most candidates were able to gain at least one mark for the first output on this question with many gaining full marks. A small minority of candidates simply copied the outputs given in the question stem.

Question 1 (d) (ii)

(ii) Orla has rewritten her LMC code to fix the error and added an additional `DAT`.

Complete the LMC code to output the first five correct numbers in the Fibonacci sequence (0,1,1,2,3).

```
        START     LDA    MAX
                  BRZ    END
                  LDA    A
                  OUT
                  ..........................................
                  STA    TEMP
                  ..........................................
                  ADD    B
                  STA    B
                  ..........................................
                  STA    A
                  LDA    MAX
                  SUB    ONE
                  STA    MAX
                  BRA    START
        END       HLT
        A         DAT    0
        B         DAT    1
..................DAT    0
        MAX       DAT    5
        ONE       DAT    1
```

[4]

Most candidates were able to get the mark for the final answer gap and there was a good range of marks across the cohort.

Question 1 (e)

(e) In Orla's LMC code, she used direct memory addressing.

Give **three** other modes of memory addressing.

1 .....

2 .....

3 .....

[3]

Most candidates were able to give indirect as a mode of memory addressing and there were many candidates who gained full marks on this question. A small number of candidates gave responses like by reference or value, and some gave direct which was mentioned in the question stem.

Question 1 (f)

(f) Since the development of high level languages, the use of assembly languages has reduced.

Give **two** reasons why in some circumstances programmers will choose to write code in assembly language.

1 .....

.....

2 .....

.....

[2]

More successful candidates were able to give two valid reasons. Less successful candidates tended to give responses like it is easier to read or easier for the computer to understand. Some candidates were confused between an assembler and compilers/interpreters. The most common correct responses were the programmer wanting direct control over the hardware and it needing to be written for specific hardware.

Question 1 (g)

(g) The performance of a computer system can be improved by adding more RAM.

Explain why adding more RAM will improve the performance of a computer system.

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.....

.....

.....

.....

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

Most candidates were able to gain 1 or 2 marks on this question. Some confused primary with secondary saying that adding more RAM meant there was less need to use primary memory. Some confused RAM with Cache.

Question 2 (a)

2 An embedded system is often a small device that is designed to carry out a limited number of specialised tasks. Professional athletes sometimes wear small embedded systems called fitness trackers in their shirts. These can be used to track their speed, position, heart rate and other performance data during an event. The tracker transmits this data to a pitch-side server which collates the data from all the athletes.

(a) State the name of **one** input device that might be used in this embedded system and state what it would be used for.

Device .....

.....

Use .....

.....

[2]

The majority of candidates were able to state the name of a device, but many did not apply the use of their named input device to the scenario and gave responses related to a generic use of the device for example giving a heart rate sensor or monitor and then saying the use was to monitor the heart rate with no reference to the fitness tracker. A few gave devices which were unsuitable for an embedded system carried in a shirt such as keyboard and touchscreen.

Question 2 (b)

(b) The fitness tracker manufacturers had to decide which type of secondary storage to use.

Explain **two** reasons why flash (solid state) storage would be the best type of secondary storage for the fitness tracker system.

1 .....

.....

.....

.....

2 .....

.....

.....

.....

[4]

The majority of candidates were able to give a reason such as durable/no moving parts/ small physical size. Candidates who related the reason to why it would be suitable for the fitness tracker were able to gain full marks. Some candidates did not apply their response to the question stem well and instead talked about things like smart watches.

Exemplar 2

1 Flash storage has no moving parts so it is more shock resistant than other storage devices (which ~~either~~ require moving components to read or write data). this means that it would be less likely to get damaged during activities like running that the athletes may partake in

2 Flash storage is also very small in size (~~but still~~ at the same capacity) so the overall device could be smaller. This would make it easier to carry (i.e., it is more portable due to smaller weight and dimensions) and therefore distract/~~distracting~~ impact the athletes less.

[4]

The candidate has clearly given two reasons with good application to the scenario.

Question 2 (c) (i)

(c) One use of ROM is to store the Basic Input Output System (BIOS). The BIOS is used when the computer is first turned on.

(i) Describe what the BIOS will do to start up the computer.

.....

.....

.....

.....

.....

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

Many candidates were able to gain at least one or two marks for saying the BIOS finds/loads the operating system and/or checks hardware.

Question 2 (c) (ii)

(ii) Apart from storing the BIOS, ROM can also be used in other ways.

Describe how the embedded system can make a different use of ROM and why it is an advantage.

.....

.....

.....

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

Strong candidates were able to give a use such as store the operating system and an advantage. Many though, gave a very good description of what ROM is but did not give a different use and so were unable to gain any marks. A few candidates said it could store the BIOS which had already been given in the question. A few candidates talked about microwaves and washing machines which was not relevant to this scenario

Question 2 (d) (i)

(d) The embedded system will have an operating system. Two roles of an operating system are to handle interrupts and manage scheduling.

(i) Describe **two** other roles of an operating system.

1 .....

.....

.....

.....

2 .....

.....

.....

.....

[4]

This was generally well answered and the majority of candidates could give two roles. Less successful candidates were then unable to follow through with a reasonable description. More successful candidates were able to give two roles plus relevant and correct descriptions. Some described scheduling and interrupts which were given in the question and gained no marks.

Question 2 (d) (ii)

(ii) Draw a line to match each scheduling algorithm to the correct description.

Scheduling Algorithm	Description
Round Robin	Splits processes into different priority queues based on the amount of processor time they need. It allows them to move between the queues as their characteristics change
First come first served	Selects the process that takes the shortest amount of time to complete. The processes are run until they are fully complete
Multi-level feedback queues	Each process is allocated a fixed amount of CPU time. If the process is not complete it will be suspended and the next process will start
Shortest job first	Each process is given equal priority and they are processed in the order they arrive
Shortest remaining time	Selects the process that takes the shortest amount of time. The process can be suspended if another shorter process is added

[5]

Generally well answered and most candidates gained full marks. Those that did not tended to confuse shortest remaining time with shortest job first but were still able to gain three marks.

Question 2 (e)*

(e)* The fitness trackers will send athletes' performance data to a pitch-side server. A program needs to be developed to analyse this data and display the results.

Different words, colours and charts will be displayed to indicate how well athletes are performing.

The program will be used by athletes from different cultures all over the world.

Discuss the layout considerations that the programmer needs to consider when creating the program user interface for different cultures.

You should include the following in your answer:
- layout considerations
- colour considerations
- character set considerations.

[9]

There were a good range of Level 2 responses with good discussions for at least two of the bullet points and related to different cultures. Some candidates were unable to apply their knowledge to different cultures and instead discussed accessibility concerns. The candidates with Level 3 responses gave good discussions of all three bullet points and related it to different cultures and the athletes. They were also able to discuss how the programmer could go about this.

Assessment for learning

Candidates should be aware that in level of response questions application of knowledge to the scenario is needed to get into the Level 2 and Level 3 mark bands.

Question 3 (a)

3 OCR Solutions is a software development company. Employees use a wide range of application software to complete admin tasks. Tasks include writing letters to clients and creating graphics.

(a) State the most appropriate application software for each task in the table.

Task	Application Software
Creating graphics such as a logo	
Writing letters to clients to confirm their appointment date and time	
Calculating the company profits at the end of each month	
Storing, searching and updating client details and purchases	
Creating brochures and flyers about the organisation	

[5]

Many candidates were able to score at least 4 marks on this question. Those who gave brand names were not given marks as is standard for these types of question. Few candidates were able to give DTP for the fifth application type. Many gave email for the second application type which would not be the most appropriate for writing letters to clients.

Question 3 (b)

The application software is run on thin client computers. A thin client computer is a very low-powered computer connected to a powerful central server. The operating system and all the applications run within a virtual machine on the server. The thin client computer will only display the output of the virtual machine and capture and send input to the virtual machine.

(b) State **one** advantage of running the application software within the virtual machine.

.....

..... **[1]**

There were some good responses to this question with many giving the response that Malware would not affect the server. Some talked about being able to try out different operating systems which was not relevant to this scenario.

Question 3 (c)

(c) The thin client computer needs to send data that is input by the user to the server so that the virtual machine can process it. For example, it will send text entered by the user on the thin client computer to the application software running on the virtual machine.

Data is compressed in order to improve the speed of data transmission between the client and the server.

Explain why lossless compression should be used instead of lossy compression.

.....

.....

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.....

.....

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

This is a common topic in previous papers and most candidates were able to gain at least one mark with more successful candidates gaining all three. Some candidates gave responses that were too vague and did not relate to the question stem.

Question 3 (d) (i)

(d) OCR Solutions make use of software libraries when writing their programming code. They also make use of linkers and loaders to compile and run the program.

(i) Describe what **linker** means.

.....

.....

.....

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

The majority of candidates were able to gain one mark on this question for stating that a linker links code with libraries but few went on to then describe it forming a single executable file.

Question 3 (d) (ii)

(ii) Describe what **loader** means.

.....

.....

.....

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

Many candidates confused loaders with compilers and IDEs and talked about being able to use libraries in source code or loading code into the compiler.

Question 4 (a) (i)

4

(a) Two's complement can be used to represent negative binary numbers.

(i) Convert the denary number -124 into an 8-bit two's complement binary number.

.....

.....

.....

..... **[1]**

This was generally well answered with the majority of candidates gaining full marks. Those that did not had either got it completely wrong or had missed or added an extra zero.

Question 4 (a) (ii)

(ii) State **one** other way to represent negative binary numbers.

.....

..... **[1]**

This was generally well answered and the majority of candidates gained one mark.

Question 4 (b)

(b) Convert the denary number 298 into hexadecimal.

.....

.....

.....

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

This was generally well answered and the majority of candidates gained two marks.

Question 4 (c)

(c) The binary number **10011101 0110** is stored in **normalised** floating point form with an 8-bit mantissa and a 4-bit exponent both written in two's complement.

Convert this binary number into denary.

You must show your working.

.....

.....

.....

.....

.....

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

The majority of candidates were able to gain a mark for converting the exponent to 6 and many were able to gain the second mark for moving the point 6 places to the right. Many candidates gained full marks although some were unable to convert the binary number back to denary to give -49.5

Question 4 (d)

(d) The binary number **00001011 0111** is represented in **unnormalised** floating point form with an 8-bit mantissa and a 4-bit exponent both written in two's complement.

Convert this binary number into a **normalised** floating point binary number, represented using an 8-bit mantissa and 4-bit exponent format.

You must show your working.

.....

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.....

..... **[4]**

There were a range of responses with more successful candidates gaining full marks. Some candidates lost marks for incorrectly writing the final mantissa to 8 bits.

Question 4 (e)

(e) Calculate the binary addition of these two 8-bit (unsigned) binary numbers.

Show your working.

00110111
10011001 +

[2]

The majority of candidates were able to gain full marks on this question showing accurate working out and a correct response.

Question 5 (a)

5 Ben installs burglar alarms. The alarm is made up of a door sensor and a motion sensor. When the alarm is set, the siren will sound if either the door sensor or the motion sensor detect movement.

The alarm also has a test mode setting. When the test mode setting is enabled, an engineer can check the sensors are working without the siren going off.

(a) The inputs to the alarm are as follows.

Input	System
A	Door sensor
B	Motion sensor
C	Alarm has been set
D	Test mode enabled

Draw a logic circuit to show the logic that is used in the burglar alarm to determine if the siren goes off.

[4]

There were a range of marks on this question. More successful candidates gave all four gates accurately, but most candidates were able to gain at least one or two marks. Some candidates were unaware of what a logic circuit was and instead produced a range of different diagrams including flow charts.

Question 5 (b) (i)

(b)
(i) Simplify the Boolean expression **¬A v ¬B** using De Morgan's First Law.

..... **[1]**

Many candidates gained full marks with the most common error being ¬ (A v B)

Question 5 (b) (ii)

(ii) Simplify the Boolean expression **¬(¬B)** using double negation.

..... **[1]**

Almost all candidates were able to gain a mark on this question.

Question 5 (b) (iii)

(iii) Simplify the Boolean expression **(A v B)** ∧ **(A v C)** using distribution.

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

The majority of candidates recognised that distribution meant that there was only one A following simplification but the most common error for the second mark was again to use OR instead of AND for B AND C

Question 6* (a)

6* A company wants more customers to be able to find their website on the internet.

(a) Discuss why search engine indexing and page ranking will be important in achieving this.

You should include the following in your answer:
- what search engine indexing means and what information is collected
- what PageRank means and possible factors that can affect a PageRank score of a website
- possible ways for the company to improve the PageRank score of pages on its website.

[12]

Many candidates were able to discuss some factors that affect PageRank and how the website could improve it. Far less were able to discuss search engine indexing correctly. Some were able to apply their knowledge to the scenario. More successful candidates were able to give a good description of both search engine indexing and PageRank as well as relevant suggestions for how the website could improve their PageRank.

Question 6 (b)

(b) The company would like to start selling their products on their website. They will use both client side and server side processing to do this.

Tick (✓) **one** box on each row to identify whether each task would be best performed on the client side or the server side.

Task	Client Side	Server Side
Loading the website HTML code		
Applying CSS styles to a website		
Running JavaScript code to check that the customer surname has been entered on the order form		
Running queries on the database to check if an item is available in stock		

[4]

Most candidates were able to gain 2 or 3 marks on this question with many gaining all 4 marks. The most common error was ticking server side for Running JavaScript to check the surname.

Question 6 (c)

(c) When customers contact the company, their computers will use a number of protocols such as TCP/IP and HTTP to make connections with other devices over the internet.

Explain what a protocol is and why they are important in network communications.

.....

.....

.....

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

Most candidates were able to explain that a protocol is a set of rules for communication between devices. Few then went on to explain what that meant and so the majority of candidates gained one mark.

Question 6 (d)

(d) Describe **three** different pieces of networking hardware in a client–server network apart from the clients and servers themselves.

1 .....

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.....

.....

2 .....

.....

.....

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3 .....

.....

.....

.....

[6]

The majority of candidates could give three different pieces of networking hardware but many were unable to then describe what they did with many putting connects devices for the description of each piece of hardware.

Question 7*

7* Rosa has recently opened a new leisure centre. Currently she has 150 members, however, she is estimating that this will increase to around 10 000 members.

Rosa will store members' details in a database. She will also store gym class bookings and appointments with fitness instructors.

Rosa is considering using either a flat file database or a relational database.

Discuss the benefits and drawbacks of flat file databases and relational databases and which one would be the most suitable for Rosa.

You should include the following in your answer:
- the features of flat file databases and relational databases
- the benefits and drawbacks of each type of database
- which type of database would be the most suitable for Rosa.

[9]

There were some really good responses to this question. More successful candidates were able to explain the features of both types of database as well as giving relevant benefits and drawbacks of each which they then applied to the scenario well and gave a recommendation. Some candidates gave good descriptions of the features of each type but were unable to apply their knowledge to the scenario other than saying the membership was going to increase. There were a number of candidates who confused a database with a table stating that a relational database was a number of related databases and not a number of related tables.

Misconception

The main misconception was to confuse database with table although some candidates also confused the different keys used in a relational database and what they were used for.

Exemplar 3

A flat file database is a type of database that only contains one table. This means that all data is stored in one table, made up of records and fields. It doesn't require a primary key, or to be normalised. A relational database uses multiple tables linked together using foreign keys, which creates one to many relationships between the different tables in the database

A flat file database has many advantages. Firstly, it is simple to understand ~~and~~, create and modify. This is because all records are stored in one table, so all the information is in one place. However, there are drawbacks to this. If a ~~club~~ member were to both multiple classes and appointments, extra records would be created. This would result in a large amount of redundant data being included, such as a members details appearing more than once. This not only increases the amount of space the database takes up, but also makes it more difficult to search the database.

A relational database also has many benefits. When a relational database has been normalised, it becomes very efficient to search and locate records within it. As well as this, through the process of normalisation, large amounts of redundant data would be deleted, reducing the storage space required for

the database. For example, by creating a separate table for appointments, and another for classes, and another for member details, the membership details wouldn't need to be written out again each time an appointment or class is booked, saving Rosa time.

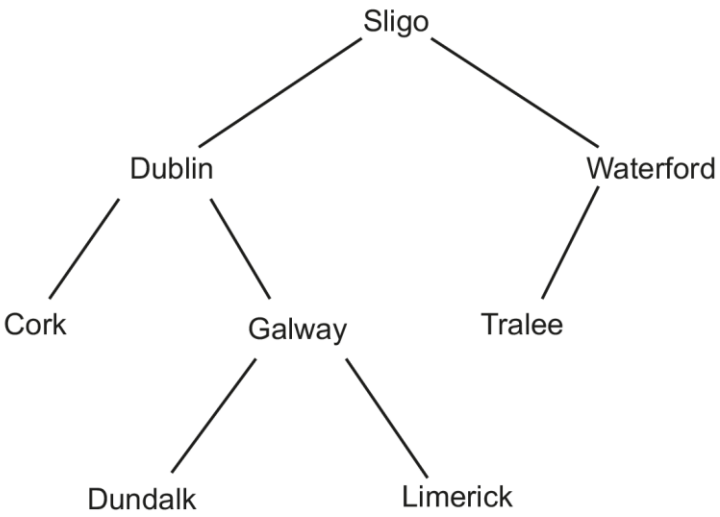
Overall, a relational database would be much more suitable for Rosa. Although a flat file database is fine for Rosa & case with 150 members, if she has 10,000 members in her leisure centre it will be incredibly difficult to locate specific records when searching, as there would be far too much redundant data, ~~Hence~~, and the file size would be incredibly large if extra details are included each time an appointment is made. However, if Rosa were to use a relational database, there would be much less redundant data, therefore reducing the file size and making it easier for her to find records. Additionally secondary keys and indexing could be used on a relational database to speed up the search process, although this may not be possible with 10,000 members due to the file size increased. Therefore, she should use a relational database.

The candidate has shown good application to the scenario as well as benefits and drawbacks of both database types. They have made a valid recommendation which is justified.

Question 8 (a)

8 **Fig. 8** shows a binary search tree that contains the names of different towns in Ireland.

Fig. 8



The binary search tree is held in a 2-dimensional array called `towns` with 8 rows and 3 columns.

(a) Write a line of program code or pseudocode to declare the array `towns`.

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

Many candidates were able to gain full marks with most being able to gain one. Many candidates did not specify the number of elements in the array which was given in the question and tended to give responses such as towns = [ ] and as such only gained one mark.

Question 8 (b) (i)

(b)

(i) In the 2-dimensional array `towns`:

- the **first** column contains a pointer to the left side
- the **second** column contains the data
- the **third** column contains a pointer to the right side.

Leaf nodes have the pointer `null`.

Complete the table showing the contents of the `towns` array to store the binary search tree shown in **Fig. 8**.

	Left	Data	Right
0		Sligo	
1		Dublin	
2		Cork	
3		Waterford	
4		Galway	
5		Limerick	
6		Tralee	
7		Dundalk	

[4]

The question states that the first and third column contain a pointer and the second contains the data. The biggest error by far was candidates putting data in the first and third column instead of a pointer which meant that many only gained a mark for having null in the last two rows. More successful candidates were able to gain full marks.

Question 8 (b) (ii)

(ii) **Four** more towns are added to the binary search tree shown in **Fig. 8** in this order:

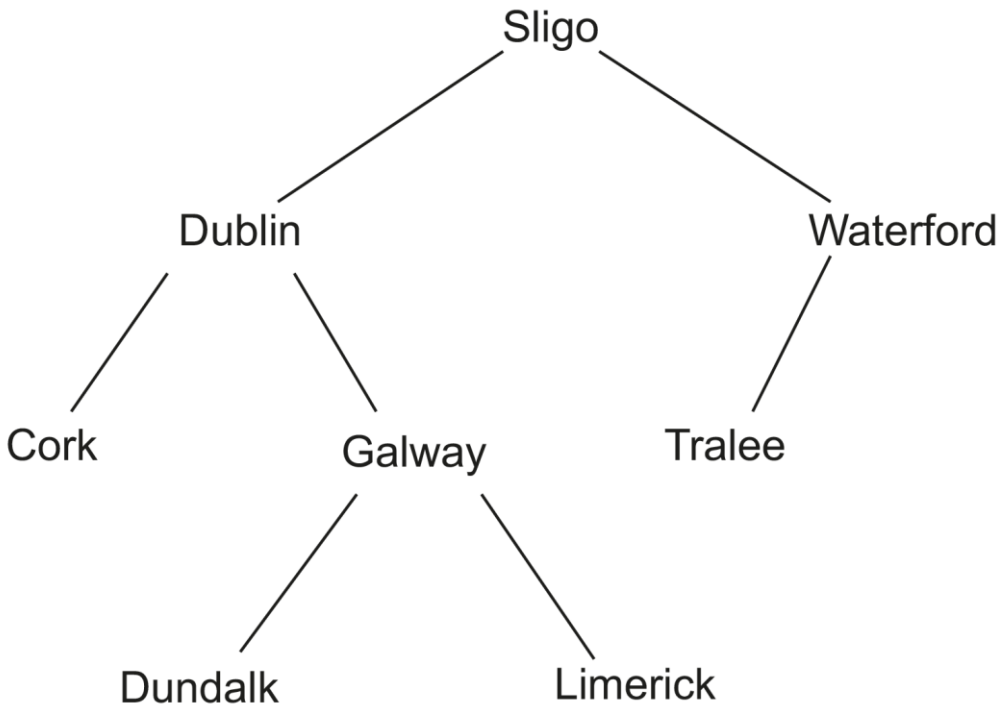
Mallow

Cavan

Tuam

Wexford

Complete this binary search tree by adding the new towns to it.



[4]

This was generally well answered and many candidates gained full marks with many candidates writing out the alphabet beneath the question to aid then in placing the new towns.

Question 9

9 OCR DogCare look after dogs while their owners are at work. They use a program developed in an object-oriented paradigm to store details about each dog.

Each dog is declared by using an instance of the class `Dog`. This has these private attributes:

- `name`
- `breed`
- `height`
- `weight`

The constructor method sets all the attributes to the values passed in as parameters.

Write pseudocode or program code to define the class `Dog`. You should include the attributes and constructor method.

You **do not** need to write the set or get methods.

.....

.....

.....

.....

.....

.....

..... **[5]**

There were a range of responses to this question with the most common responses being written in pseudocode or python. There was a clear division between candidates who were comfortable writing Object Oriented Programming (OOP) code and class constructors and those that were not.

Less successful candidates with little OOP experience often confused the class declaration with the constructor declaration. A few input the values rather than setting the attributes to the values passed in the parameters.

Question 10 (a)

10 An investigative firm wants to start investigating cyber security issues.

(a) Government bodies have been given additional powers under the Regulation of Investigatory Powers Act.

State **three** additional powers that this law gives to some government bodies.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

There were a number of candidates who could not accurately name one additional power.

Question 10 (b)

(b) As part of their new roles, employees will be accessing personal data. In order to facilitate this, all employees are enrolled on a course about the Data Protection Act.

Identify **three** principles of the Data Protection Act.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

This was generally well answered and candidates showed good understanding of the Data Protection Act (DPA) principles.

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Access to Scripts

We've made it easier for Exams Officers to download copies of your candidates' completed papers or 'scripts'. Your centre can use these scripts to decide whether to request a review of marking and to support teaching and learning.

Our free, on-demand service, Access to Scripts is available via our single sign-on service, My Cambridge. Step-by-step instructions are on our website.

Keep up-to-date

We send a monthly bulletin to tell you about important updates. You can also sign up for your subject specific updates. If you haven't already, sign up here.

OCR Professional Development

Attend one of our popular professional development courses to hear directly from a senior assessor or drop in to a Q&A session. Most of our courses are delivered live via an online platform, so you can attend from any location.

Please find details for all our courses for your subject on **Teach Cambridge**. You'll also find links to our online courses on NEA marking and support.

Signed up for ExamBuilder?

ExamBuilder is a free test-building platform, providing unlimited users exclusively for staff at OCR centres with an Interchange account.

Choose from a large bank of questions to build personalised tests and custom mark schemes, with the option to add custom cover pages to simulate real examinations. You can also edit and download complete past papers.

Find out more.

Active Results

Review students' exam performance with our free online results analysis tool. It is available for all GCSEs, AS and A Levels and Cambridge Nationals (examined units only).

Find out more.

You will need an Interchange account to access our digital products. If you do not have an Interchange account please contact your centre administrator (usually the Exams Officer) to request a username, or nominate an existing Interchange user in your department.

Online courses

Enhance your skills and confidence in internal assessment

What are our online courses?

Our online courses are self-paced eLearning courses designed to help you deliver, mark and administer internal assessment for our qualifications. They are suitable for both new and experienced teachers who want to refresh their knowledge and practice.

Why should you use our online courses?

With these online courses you will:

- learn about the key principles and processes of internal assessment and standardisation
- gain a deeper understanding of the marking criteria and how to apply them consistently and accurately
- see examples of student work with commentary and feedback from OCR moderators
- have the opportunity to practise marking and compare your judgements with those of OCR moderators
- receive instant feedback and guidance on your marking and standardisation skills
- be able to track your progress and achievements through the courses.

How can you access our online courses?

Access courses from Teach Cambridge. Teach Cambridge is our secure teacher website, where you'll find all teacher support for your subject.

If you already have a Teach Cambridge account, you'll find available courses for your subject under Assessment - NEA/Coursework - Online courses. Click on the blue arrow to start the course.

If you don't have a Teach Cambridge account yet, ask your exams officer to set you up – just send them this link and ask them to add you as a Teacher.

Access the courses **anytime, anywhere and at your own pace**. You can also revisit the courses as many times as you need.

Which courses are available?

There are **two types** of online course: an **introductory module** and **subject-specific** courses.

The introductory module, Building your Confidence in Internal Assessment, is designed for all teachers who are involved in internal assessment for our qualifications. It covers the following topics:

- the purpose and benefits of internal assessment
- the roles and responsibilities of teachers, assessors, internal verifiers and moderators
- the principles and methods of standardisation
- the best practices for collecting, storing and submitting evidence
- the common issues and challenges in internal assessment and how to avoid them.

The subject-specific courses are tailored for each qualification that has non-exam assessment (NEA) units, except for AS Level and Entry Level. They cover the following topics:

- the structure and content of the NEA units
- the assessment objectives and marking criteria for the NEA units
- examples of student work with commentary and feedback for the NEA units
- interactive marking practice and feedback for the NEA units.

We are also developing courses for some of the examined units, which will be available soon.

How can you get support and feedback?

If you have any queries, please contact our Customer Support Centre on 01223 553998 or email support@ocr.org.uk.

We welcome your feedback and suggestions on how to improve the online courses and make them more useful and relevant for you. You can share your views by completing the evaluation form at the end of each course.

Need to get in touch?

If you ever have any questions about OCR qualifications or services (including administration, logistics and teaching) please feel free to get in touch with our customer support centre.

Call us on
01223 553998

Alternatively, you can email us on
support@ocr.org.uk

For more information visit
ocr.org.uk/qualifications/resource-finder
ocr.org.uk
facebook.com/ocrexams
twitter.com/ocrexams
instagram.com/ocrexaminations
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We really value your feedback

Click to send us an autogenerated email about this resource. Add comments if you want to. Let us know how we can improve this resource or what else you need. Your email address will not be used or shared for any marketing purposes.

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Please note – web links are correct at date of publication but other websites may change over time. If you have any problems with a link you may want to navigate to that organisation's website for a direct search.

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