OCR
Oxford Cambridge and RSA

Level 3 Alternative Academic Qualification Cambridge Advanced National in IT: Data Analytics

H019/H119 F200: Fundamentals of data analytics

Sample Assessment Material (SAM)

Time allowed: 1 hour 15 minutes

CXXX/XXXX

No extra materials are needed.

Please write clearly in black ink. **Do not write in the barcodes.**

Centre number | | | | |

Candidate number | | | |

First name(s) _____

Last name _____

Date of birth | D | D | M | M | Y | Y | Y | Y |

INSTRUCTIONS

- Use black ink.
- Write your answer to each question in the space provided. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- In the live exam there might be lined pages at the end of the question paper for you to use if you need extra space. Remember, you must clearly show the question numbers.
- Answer **all** the questions.

INFORMATION

- The total mark for this paper is **60**.
- The marks for each question are shown in brackets **[ ]**.
- This document consists of **18** pages.

ADVICE

Read each question carefully before you start your answer.

1 What is data?

Tick (✓) **one** box.

A general rule ☐

Identity of things ☐

Raw facts and figures ☐

Useful items about something ☐

[1]

2 In a chain of pizza restaurants, each restaurant uses a spreadsheet to keep track of their daily and weekly pizza sales.

This is part of the spreadsheet for one of the restaurants.

Pizza sizes	Prices	Number of pizzas sold		
		Sat	Sun	Total
Small	£9.00	40	20	60
Large	£14.00	90	10	100
Total		130	30	160

(a) Identify **two different** items of **information** the restaurant can get from this data

1 ....

....

2 ....

....

[2]

(b) Identify three different pieces of knowledge the restaurant can get from the information in the spreadsheet.

1 ....

....

2 ....

....

3 ....

....

[3]

The chain of pizza restaurants uses big data from all their restaurants.

(c) Explain **two** benefits of using big data to the chain of pizza restaurants.

1 ....

....

....

2 ....

....

....

[4]

Turn over

3 Complete the sentence to describe the purpose of data analytics.

Use words from the list.

You can use each word once, more than once or not at all.

analysis   calculations   errors   trends

The purpose of data analytics is to apply statistical …………………… and technologies on

data to find …………………… and solve problems**.**

[2]

4 What is data **format**?

Tick (✓) **one** box

Layout ☐

Look ☐

Structure ☐

Style ☐

[1]

5 A travel company stores data on the holidays it offers. The data includes destinations, dates and prices. This data is **structured**.

1 ....

....

2 ....

....

[2]

6 The table shows important aspects of current legislation (acts) relating to the use of data and information.

Complete the table to identify the act that each important aspect relates to.

Write the name of **one** act in each of the **three** spaces in the table.

Important aspect	Act
Gives people specific privacy rights in relation to electronic communications	....
Protects data held by companies from hackers	....
Gives people a right of access to recorded information held by UK public authorities	....

[3]

7 A flower grower is using a range of images to promote a new flower variety on their social media page.

The images are in **jpeg** format.

Explain **one** benefit to the flower grower of using **jpeg** for this purpose.

....

....

....**[2]**

8 A researcher is interviewing local people in the town centre throughout the day. The researcher wants to get opinions on the most suitable place for a new pedestrian crossing in the town centre.

Explain **two** benefits to the researcher of gathering data in this way

1 ....

....

....

2 ....

....

....

[4]

9 The **five** phases of data lifecycle management (DLM) are shown below.

The phases are **not** in the correct order.

Phase	Action
A	Usage
B	Archival
C	Destruction
D	Storage
E	Creation

Write a letter for each phase in each box to show the **correct** order.

One phase **(A)** has been done for you.

start

A

end

[3]

Turn over
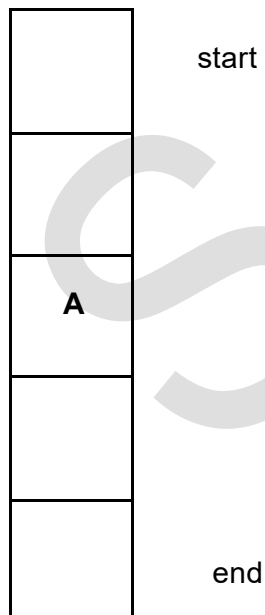
10 A large business supplies car parts. They have recruited a new database administrator.

One duty is to add data and pictures to a stock file of car parts.

(a)

(i) What **two** user rights to the computer system will the database administrator need?

1 ....

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

(ii) Explain why the database administrator will need each user right in **10 (a)(i)**.

1 ....

....

2 ....

....**[2]**

(b)

(i) State **one communication** skill that a database administrator needs.

....**[1]**

(ii) Explain why the skill in **10 (b)(i)** is needed.

....

.... **[1]**

11 Complete the table to match the correct web Application Programming Interface (**API**) certification to its **use**.

Use words from the list.

Write the name of **one** API in each of the **two** spaces in the table.

Composite   **Partner**   **Private**   **Public**

Use	API
Provides restricted access, intended for specific purposes	....
Allows external users to access data or services	....

[2]

Turn over

12 A new book-publishing company currently has seven staff in total. The book-publishing company wants to reorganise its data storage system.

Four staff work in the small main office and three work remotely from home. The company does not have dedicated IT staff. The staff mainly use word processing software, an accounts database, payroll system and an email system.

Discuss whether the book publishing company should use a Network Attached Storage (NAS) system.

In your answer you **must** write about:

- Any **benefits** for the book-publishing company
- Any **limitations** for the book-publishing company
- Whether you would recommend that the book-publishing company use an NAS **and** the reasons why.

[6]

....

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....

13 Complete the sentences to explain each job role.

Use job roles from the list.

You can use each job role once, more than once or not at all.

Data Analyst

Data Engineer

Data Scientist

Database Administrator

A …………………………………….. organises and studies the data to get insight for a business.

A …………………………………….. builds systems and develops algorithms to transform data into useful information.

[2]

Turn over

14 A new company is developing a range of new products. The company wants to develop an infographic to promote the new products on their website.

(a) Explain **two** benefits of using an infographic for this purpose.

1 ....

....

2 ....

....

[4]

The new company is considering storing their data on a cloud storage system.

(b) Analyse the possible impacts on the new company of using a public cloud.

[6]

....

....

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Turn over

15 A college wants to create a chart showing what proportions of the total number of their students travel to college by car, bus or train. The data is in a spreadsheet.

This is part of the spreadsheet.

Method	Number of students
Car	80
Bus	200
Train	60

(a) State the most suitable type of chart for the data.

....**[1]**

(b) Explain why the chart in **15 (a)** is suitable**.**

....

....**[1]**

16

(a) State **one** personal attribute needed for the role of Artificial Intelligence (AI) Scientist.

....**[1]**

(b) State **one** personal attribute needed for the role of Artificial Intelligence (AI) Scientist.

....**[1]**

(c) State **one** reason why the attribute in **16 (a)** is needed.

....

....**[1]**

Turn over

17 A government office is updating their network system. The office stores highly sensitive data and needs to limit user access to the system.

(a) Identify the user access control that would be most suitable for the office.

....**[1]**

(b) Identify **two** reasons that the control in **17 (a)** would be most suitable for the office.

1 ....

....

2 ....

....
[2]

END OF QUESTION PAPER

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This is sample assessment material for our specification. It is to help show how the live assessment materials will look. During the lifetime of the qualification you might see small adjustments to the assessment materials. This is part of continuous improvement, designed to help you and your students. We recommend you look at the most recent set of past papers where available.

OCR
Oxford Cambridge and RSA

OCR Level 3 Cambridge Advanced National in IT:

Unit F200 – Fundamentals of data analytics

SAMPLE ASSESSMENT MATERIAL

MARK SCHEME

This document has **14** pages.

MARKING INSTRUCTIONS

Crossed-out answers

If a student has crossed out an answer and written a clear alternative, do **not** mark the crossed-out answer.

If a student has crossed out an answer and **not** written a clear alternative, give the student the benefit of the doubt and mark the crossed-out answer if it's readable.

Multiple choice question answers

When a multiple choice question has only one correct answer and a student has written two or more answers (even if one of these answers is correct), you should **not** award a mark.

When a student writes more than one answer

1. Questions that ask for a set number (including 1) of short answers or points

If a question asks for a set number of short answers or points (e.g. **two** reasons for something), mark only the **first set number** of answers/points.

First mark the answers/points against any printed numbers on the answer lines, marking the **first** answer/point written against each printed number. **Then**, if students have not followed the printed numbers, mark the answers/points from left to right on each line and **then** line by line until the set number of answers/points have been marked. Do **not** mark the remaining answers/points.

2. Questions that ask for a single developed answer

If a student has written two or more answers to a question that only requires a single (developed) answer, and has **not** crossed out unintended answers, mark only the first answer.

3. Contradictory answers in points-based questions

When a student has written contradictory answers, do **not** award any marks, even if one of the answers is correct.

Levels of Response marking

1. To determine the level start at the highest level and work down until you reach the level that best describes the answer

2. To determine the mark within the level, consider the following:

Quality of the answer	Award mark
Consistently meets the criteria for this level	At the top of the level (6 and 9 mark questions)
Meets the criteria but with some inconsistency	At the middle of the level (9 mark questions)

On the borderline of this level and the one below	At the bottom of the level (6 and 9 mark questions)

ANNOTATIONS

Annotation	Meaning

MARK SCHEME

1	
Max mark	1 (PO1)
Answer	Raw facts and figures (1)
Guidance	Correct answer only

2 (a)	
Max mark	2 (PO2)
Answer	Any **two** from: • Price of any size pizza (1) • Sales of any size pizza on any day (1) • Total sales of each size pizza (1) • Total overall pizza sales per day (1) • Total overall pizza sales over three days (1)
Guidance	1 mark for each correct answer. Do **not** accept: • Answers about knowledge (as in **2b**) • Pizza sizes (i.e. repeating headings with no context) • Prices (i.e. repeating headings with no context) • Number of pizzas sold (i.e. repeating headings with no context)

2 (b)	
Max mark	3 (PO2)
Answer	Any **three** from: • Sunday is the worst day for sales (1) • Saturday is the best day for sales (1) • Small is the least popular pizza (1) • Large is the most popular pizza (1) • Most/least popular size pizza on any given day (1) • The income/sales revenue for small pizzas is the smallest (1) • The income/sales revenue for large pizzas is the highest (1) **Credit any other appropriate response**
Guidance	1 mark for each correct answer Do **not** accept: • Answers about information (as in 2a) • Repeated answers worded differently (credit only the first answer)

2 (c)	
Max mark	4 (PO2)
Answer	Up to **two** marks for each benefit to the organisation. **One** mark for identifying a benefit. Second mark for specific application to pizza chain. • Analyse past sales data across the chain (1) to ensure right number of staff for each time of year (1) • Analyse customer data (1) to allow the chain to send out personalized offers (1) • Connect to the ordering system (1) to predict what will be ordered at particular hours of the day (1) **Credit any other appropriate response**
Guidance	Up to 2 marks for each benefit

	Do **not** accept: • Answers not related to the scenario

3	
Max mark	2 (PO1)
Answer	• Analysis (1) • Trends (1)
Guidance	Correct answers only

4	
Max mark	1 (PO1)
Answer	Structure (1)
Guidance	Correct answer only

5	
Max mark	2 (PO1)
Answer	Max 2 marks One mark for Structured One mark for any **one** reason from • Data can be stored in an organised format (1) • Data can be stored in tables/columns and rows (1) • Data is text and numbers (1) **Credit any other appropriate response**
Guidance	

6	
Max mark	3 (PO1)
Answer	

Important aspect	Act
Gives people specific privacy rights in relation to electronic communications	Privacy and Electronic Communications Regulations / PECR (1)
Protects data held by companies from hackers	Computer Misuse Act / CMA (1)
Gives people a right of access to recorded information held by UK public authorities	Freedom of Information Act / FIA (1)

Guidance	Correct answers only

7	
Max mark	2 (PO2)
Answer	Max two marks One mark for benefit. One mark for expansion. Any **one** benefit **plus** expansion from the following: • File can be compressed (1) so a large number of images can quickly be uploaded to their social media page (1) • Highly compatible file format (1) so it's more likely to be accepted by a range of social media platforms (1) • Gives accurate colour representation (1) which will show flower to best effect (1) **Credit any other appropriate response**

Guidance	

8	
Max mark	4 (PO2)
Answer	Up to **two** marks for each benefit. **One** mark for identifying the benefit. **One** mark for saying how it will affect the researcher. • Many different people will appear throughout the day (1) so the researcher will gain a variety of opinions (1) • Responses will be appropriate (1) because researcher is in the town centre itself (1) • The researcher can see respondents' behaviour and reactions in the town centre itself (1) which provides useful insight (1) **Credit any other appropriate response**
Guidance	Do **not** accept • Answers not related to the scenario.

9	
Max mark	3 (PO1)
Answer	**E** **D** **(A)** **B** **C**
Guidance	1 mark for 1 correct answer 2 marks for 2 correct answers 3 marks for 4 correct answers Answers must be in the correct order. Correct answers only.

10 (a) (i)	
Max mark	2 (PO2)
Answer	Any **two** from: • Read (1) • Write (1) • Edit (1) • Delete (1) **Credit any other appropriate response**
Guidance	1 mark for each correct answer.

10 (a) (ii)	
Max mark	2 (PO2)
Answer	**One** mark each for an appropriate explanation for each of the rights in 10ai, e.g.: • (Read) to access stock file (1) • (Write) to create new entries (1) • (Edit) to correct any errors (1) • (Delete) to delete wrong items/data/picture (1) **Credit any other appropriate response**
Guidance	1 mark for each correct answer.

10 (b) (i)	
Max mark	1 (PO1)
Answer	Any **one** from: • Verbal (1) • Written (1) • Questioning techniques (1) **Credit any other appropriate response**
Guidance	

10 (b) (ii)	
Max mark	1 (PO1)
Answer	**One** mark for an appropriate reason relating to the skill in 10bi, e.g.: • (Verbal) for meetings with colleagues (1) • (Written) for entering data correctly (1) • (Questioning techniques) to elicit specific information (1) **Credit any other appropriate response**
Guidance	

11	
Max mark	2 (PO1)
Answer	<table><tr><th>Use</th><th>API</th></tr><tr><td>Provides restricted access, intended for specific purposes</td><td>Partner (1)</td></tr><tr><td>Allows external users to access data or services</td><td>Public (1)</td></tr></table>
Guidance	1 mark for each correct answer Correct answers only.

12	
Max mark	6 (PO3)
Levels of Response	**Level 3 (high) 5-6 marks** A **thorough** discussion which shows **detailed** evaluation, which includes: • a **range** of points from **both** sides of the argument • a **detailed** analysis in the context of the question • a **clear** conclusion(s) with **detailed** reasons/justifications • **consistent** use of appropriate subject terminology. **Level 2 (mid) 3-4 marks** An **adequate** discussion which shows **sound** evaluation, which includes: • **some** points from **both** sides of the argument

	• **some** analysis in the context of the question • an **adequate** conclusion(s) with **relevant** reasons/justifications • **some** use of appropriate subject terminology. **Level 1 (low) 1-2 marks** A **basic** discussion which shows **limited** evaluation, which includes: • a **few** points from the argument • a **limited** analysis in the context of the question • a **brief** conclusion(s) with **limited** reasons/justifications • use of appropriate subject terminology is **limited**. **0 marks** Answer is **not** worthy of credit.
Indicative content	Answers can include some of the following: Benefits: • Book publisher mainly uses office applications - NAS supports these types of application well. • Simple to set up and operate for inexperienced staff. • Small server fits on a table – operates as file server and storage media. • The equipment will occupy less office space. • Ease of backup and recovery • Easy for team to collaborate online - multiple clients can access same files on network. • System works best where majority of employees based in same workspace and central location is required for files. Only three staff work remotely. • Appropriate option for small company - cheaper than large server. • Portable system – easily moved if required. • Can connect printer and tablets. • Two factor authentication can add security. • Can also be configured to access files remotely over the Internet through a web browser. • Extra backup potential – can have multiple bays for multiple disks. Limitations: • Dependent on available bandwidth, latency can be an issue. Slow on photos, but documents are mainly text-based. • Lacks physical security against theft or damage - need to include insurance. • Difficult to scale up to higher level of users if staff expands. • More expensive than cloud options - overall may be more costly. **Credit other relevant conclusions, points and examples.**

13	
Max mark	2 (PO1)
Answer	A **data analyst** (1) organises and studies the data to get insight for a business. A **data engineer** (1) builds systems and develops algorithms to transform data into useful information.
Guidance	1 mark for each correct answer. Correct answers only

14 (a)	
Max mark	4 (PO2)
Answer	Up to **two** marks for each valid benefit identified. **One** mark for identifying the benefit. **One** mark for saying how it will affect the company e.g.: • Easy to view and remember (1) this will boost new company brand awareness (1) • Shareable on social media (1) this will increase traffic to company website (1) • Can use a pre-made template (1) this helps to keep down costs for the company (1) • Easy to update content (1) which saves time for company (1) • No language barrier (1) this will help to increase overseas customers (1) **Credit any other appropriate response.**
Guidance	Up to two marks for each valid benefit identified. Maximum **two** benefits.

14 (b)	
Max mark	6 (PO3)
Answer	**Level 3 (high) 5-6 marks** A **thorough** analysis which includes: • Identification of a range of characteristics or elements • Detailed knowledge and understanding in the context of the question • Clear explanation • Consistent use of appropriate subject terminology **Level 2 (mid) 3-4 marks** An **adequate** analysis which includes: • Identification of some characteristics or elements • Sound knowledge and understanding in the context of the question • Adequate explanation • Some use of appropriate subject terminology **Level 1 (low) 1-2 marks** A **basic** analysis which includes: • Identification of at least one characteristic or element

	• Limited knowledge and understanding in the context of the question • Basic explanation • Use of appropriate subject terminology is limited **0 marks** Answer is **not** worthy of credit.
Indicative content	Answers can include some of the following: Useful aspects of public cloud • Good option for a new company as hosted on external server - no need to invest in hardware so costs are less. • Flexible - can switch to different plan if more traffic builds up. • Some service providers may provide disaster recovery, but company need to check. • Easy to adapt to large volumes of data. • Big network of servers should provide reliability for company. Safety factors • Large providers employ experienced IT security staff - reassuring to new company. • Large providers can have the latest security systems due to greater purchasing power. • Could be risky with a small cloud service provider as they may lack appropriate expertise/security facilities - need to research providers carefully. Risk factors • Risk of service instability, for example server downtime or connection failure, threat of denial-of-service attacks. • An external server attack could compromise sensitive company data – this could affect company reputation. • Gives control to provider - company IT team won't have control over their data. • Reliance on vendor promise of backing up data. • A 3rd party could provide the cloud storage system – more risk involved. • Lack of customisation – one-size-fits-all approach, not a bespoke system for company • Provider may use multitenancy – several organisations using the same server at the same time could increase latency due to shared resources. • Company data could be stored in another country without appropriate legislation - could be a legal issue. **Credit other relevant analysis, points and examples.**

15 (a)	
Max mark	1 (PO2)
Answer	Pie chart (1)
Guidance	

15 (b)	
Max mark	1 (PO2)
Answer	Any **one** from: • Shows proportions of the total number of students (1) • Most suitable option for small data sets (1) **Credit any other appropriate response**
Guidance	

16 (a)	
Max mark	1 (PO1)
Answer	Any **one** from: • Problem-solving skills (1) • Team working skills (1) • Effective communicator (1) **Credit any other appropriate response**
Guidance	

16 (b)	
Max mark	1 (PO1)
Answer	One mark for an appropriate reason relating to the attribute in 16a, e.g.: • (Problem-solving skills) Need to be able to design models, algorithms (1) • (Team working skills) Need to work with other members of staff (1) • (Effective communicator) Need to communicate findings to others (1) **Credit any other appropriate response**
Guidance	

17 (a)	
Max mark	1 (PO2)
Answer	Mandatory Access Control / MAC
Guidance	Correct answer only.

17 (b)	
Max mark	2 (PO2)
Answer	Any **two** from: • User access based on level of user clearance (1) • MAC is the most secure model (1) • Access granted on need-to-know basis (1) • Access cannot be altered by any user (1) **Credit any other appropriate response**
Guidance	1 mark for each correct answer.

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