OCR
Oxford Cambridge and RSA

Tuesday 19 January 2021 – Afternoon
Level 3 Cambridge Technical in Applied Science
05874   Unit 22: Global scientific information

Time allowed: 1 hour 30 minutes
C343/2101

Please write clearly in black ink.

Centre number [ ][ ][ ][ ][ ]   Candidate number [ ][ ][ ][ ]

First name(s) _____

Last name _____

Date of Birth [D][D][M][M][Y][Y][Y][Y]

INSTRUCTIONS
• Use black ink. You can use an HB pencil, but only for graphs and diagrams.
• Answer **all** the questions.
• 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.

INFORMATION
• The total mark for this paper is **60.**
• The marks for each question are shown in brackets **[ ]**.
• 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	/13
2	/10
3	/7
Section B: 4	/10
5	/11
6	/9
Total	**/60**

Answer **all** the questions.

Section A

This section relates to the case study on Longsight SIA (see Insert).

1   Longsight SIA is redesigning its website.

The Data Manager, has done some background reading to improve their understanding of some important regulations and keywords relating to data governance. This will help to inform her decisions about the redesign of the website.

(a)   Which Articles of the UN Convention on the Rights of Persons with Disabilities (UNCRPD) relate to the principles of accessibility and access to information?

Complete the table.

Principle	Article Number
Accessibility	
Access to information	

[2]

(b)   Explain what is meant by accessibility and give examples of how the redesign of the website should address issues of accessibility.

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....**[6]**

(c) The Information Commissioner's Office (ICO) provides codes of practice for the process of data governance.

Some of the keywords relating to these processes are listed below.

Draw a line to connect each **keyword** to a correct **description of the process**.

Keyword	Description of process

Keyword		Description of process
Anonymisation		The disclosure of data from one organisation to another organisation.
Sharing		Providing accessible information to individuals about how their personal data will be used.
Encryption		Identifiers are removed, obscured, aggregated and/or altered in some way.
Integrity		Transforming information to make it unreadable for unauthorised users.
Transparency		Compliance with legal and ethical requirements and declaration of any conflicts of interest.

[5]

2 At Longsight SIA a Senior Manager is responsible for the recruitment of local field research biologists on short term contracts around the world.

The field research biologists carry out assessments according to agreed protocols and then transfer the data using standard report proformas stored in the cloud.

Longsight SIA is a non-profit organisation and so cannot afford to provide all its field research biologists with IT equipment. This means that a number of the field research biologists must use their own IT equipment to record their observations and to transfer the data using the standard report proformas.

(a) Describe **three** access issues that the Senior Manager must discuss with potential recruits so that he can be assured that the recruits will use the IT equipment correctly when transferring data.

1...

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2...

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3...

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[6]

(b) It is essential that the field research biologists record good quality images of the crops.

They are therefore issued with digital cameras with solid state media e.g. SD Memory Card.

Suggest **two** advantages and **two** disadvantages of using a SD Memory Card.

Advantages

1...

....

2..

....

Disadvantages

1..

....

2..

....

[4]

3 Longsight SIA has a number of stakeholders.

The importance of good quality information allows the various stakeholders to have:

A. Confidence that the knowledge is accurate.

B. Reassurance that the processes are sound.

C. Confidence of a good reputation.

D. Confidence that they have a sound basis for further investigation.

(a) The table below contains quotes from the case study.

Complete the table by writing **one** letter, **A**, **B**, **C** or **D**, which best matches the quotation from the case study.

You may use each letter once, more than once or not at all.

Quotation	Letter
'The data are collected in accordance with surveying and monitoring protocols.'	
'verifying and recording data relating to crop growth and comparisons with control samples.'	
'The researchers must pass an online test before receiving approval to carry out their work.'	
'His assessments and those of others, have demonstrated the efficacy of the crop, and resulted in the government recently changing the law'	

[4]

(b) Politicians and consumers are examples of stakeholders.

These stakeholders base their decisions for the use of GM technology on good quality scientific information provided by researchers.

Another type of stakeholder is a community.

(i) From the case study, identify the community that is most directly affected by decisions to allow the commercial use of GM technology.

....**[1]**

(ii) Suggest **two** ways that the community identified in **(b)(i)** will be affected by the decision to allow the commercial use of GM technology.

1 ....

....

....

2 ....

....

....

[2]

Turn over

Section B

You do not need the case study to answer these questions.

4 Small genetic differences in bacteria give rise to strains.

Some bacterial strains have resistance to antibiotics.

Scientists can use gene sequencing to identify the genome of a strain. Doctors can use this information to prescribe the most effective antibiotic for that strain.

Beth is a computer programmer for a commercial bioscience company. She is an authorised member of a team that aims to develop an artificial intelligence (AI) system to speed up gene sequencing, strain identification and antibiotic prescription.

(a) (i) Which one of the following is the most appropriate classification for Beth's work?

Put a (ring) around the correct answer.

confidential   **private**   **public**   **sensitive**

[1]

(ii) Explain your answer to **(a)(i)**.

....

....

....**[2]**

(b) (i) Beth is an 'authorised member of a team'.

Explain what is meant by the term authorised.

....

....**[1]**

(ii) Suggest **three** ways that the computerised tasks carried out by Beth can be monitored.

1 ....

....

2 ....

....

3 ....

....**[3]**

(c) Describe **three** impacts that could result from unauthorised access to the computer system.

1..

....

2..

....

3..

....

[3]

Turn over

10

5 The Wellcome Trust is a global charitable foundation, supporting the work of researchers and scientists. The Trust maintains an online library.

A recent announcement by the Wellcome Library is shown in **Fig. 5.1**.

> The Wellcome Library is developing a world-class online resource for the history of medicine by digitising a substantial proportion of its holdings and making the content freely available on the web.
>
> We select material based on the strengths of our holdings and the interests of current or potential audiences. We also aim to create significant online resources that will stimulate research in the global health themes that underpin our collecting strategy.
>
> The Wellcome Library has made funds available to pay the open access publishing costs for research papers, monographs and book chapters that result from research based on the Wellcome Library's collections.

Fig. 5.1

(a) (i) The Wellcome Library is an information holder.

Suggest the category of information holder for the Wellcome Library.

....[1]

(ii) Explain your answer to **(a)(i)**.

....
....[1]

(b) (i) Which term indicates the main reason why the Wellcome Library is 'digitising a substantial proportion of its holdings'?

Put a (ring) around the correct answer.

funding   **ownership**   **promotion**   **sharing**

[1]

(ii) Give **two** reasons for your answer in **(b)(i)**.

1 ....
....
2 ....
....
[2]

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(c) The Wellcome Library has designed its online resource in accordance with the principles of information security.

(i) State the **three** principles of information security.

1 ....

2 ....

3 ....

[3]

(ii) Suggest which **one** of the three principles of information security is concerned with the prevention of loss of, or loss of access to, data and resources.

....**[1]**

(d) (i) UK legislation describes the conditions that libraries must comply with when making works publicly available.

Identify the name of this legislation.

Tick (✓) **one** box.

Equality Act (EQA) 2011 ☐

Computer Misuse Act 1990 ☐

Copyright, Designs and Patents Act 1988 ☐

Protection of Freedoms Act 2012 ☐

[1]

(ii) One condition of the legislation identified in **(d)(i)** is 'the work is available to individual members of the public for the purposes of research or private study.'

Suggest **one** other condition.

....

....**[1]**

6 Dr Jones is a medical research scientist supervising clinical trials.

She uses social media to advertise opportunities to participate in clinical trials.

Dr Jones has used social media to advertise for 100 volunteers to participate in a clinical trial of a new type of painkiller.

The volunteers are required to disclose medical information about themselves as well as their age, height and weight.

If recruited they must sign an agreement to say that they have understood and accepted the risks.

Only 50% of the volunteers will become patients and actually receive the drug, the rest will be given a placebo. Neither the patients or Dr Jones and her team will know which patients have received the drug.

(a) Dr Jones must ensure that all information received is given an appropriate classification.

Draw a line to connect each **information classification** to a correct **example**.

Information classification	Example

Anonymised

Non-sensitive

Private

Public

Sensitive

The advertisement for the clinical trial on social media.

The details of the clinical trial.

The patients and doctors do not know which patients have received the drug.

The patient's name, age, height and weight.

The patient's medical information.

[5]

(b) Clinical trials are expensive. Patients must be monitored for signs that show whether the medicine is effective, as well as for any signs of adverse reactions.

Protocols are designed to minimise the risk of accidentally losing clinical trial data.

(i) State **one** other risk to information security.

....**[1]**

(ii) Describe **two** precautions that minimise the risk of accidental loss of data.

1 ....

....

....

2 ....

....

....
[2]

(iii) Describe **one** consequence that may arise if the information produced by the clinical trial is of poor quality.

....

....**[1]**

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional answer space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s) – for example 1(a) or 2(a).

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