

Modified Enlarged 24 pt
OXFORD CAMBRIDGE AND RSA
EXAMINATIONS

Monday 13 June 2022 – Afternoon
Level 3 Cambridge Technical in
Applied Science
05874

Unit 22: Global scientific information
Time allowed: 1 hour 30 minutes plus your
additional time allowance

You must have:

the Insert

a ruler (cm/mm)

You can use:

a scientific or graphical calculator

an HB pencil

Please write clearly in black ink.

Centre
number

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Candidate
number

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First name(s) _____

Last name _____

Date of
birth

D	D	M	M	Y	Y	Y	Y
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READ INSTRUCTIONS OVERLEAF

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 [].

ADVICE

Read each question carefully before you start your answer.

Answer ALL the questions.

SECTION A

This section relates to the case study on Ishrig Foods (see Insert).

1 Groups such as Ishrig Foods, MSC and FAO are holders of scientific information.

(a) State the category of information holder represented by each of the groups.

(i) Ishrig Foods

_____ **[1]**

(ii) MSC

_____ **[1]**

(iii) FAO

_____ **[1]**

- (b) Identify THREE locations of scientific information held by these groups.**

Put a ring around the correct locations. [3]

developed countries

home

online

paper notepad

rural

urban

workplace

- (c) Ishrig Foods works collaboratively with many stakeholders.**

These stakeholders have different concerns.

Draw a line from each CONCERN to the STAKEHOLDER most affected. [5]

CONCERN

an industry which supports over 200 million jobs globally

illegal, unreported and unregulated fishing

the ability to offer products that display the MSC eco-label

the development of a global information exchange system

the impact of fishing practices on ecosystems

STAKEHOLDER

consumers

employees

harvesters

retailers

scientists

UN Food and Agriculture Organization

2 Part of the Agreement on Port State Measures (PSMA) is a global record of fishing vessels involved in IUU activity.

(a) Discuss the reasons for the transmission of scientific information in relation to the PSMA. [6]

(b) Data is protected by legislation and regulation in the UK and around the world.

Give FOUR reasons why countries participating in PSMA must have similar regulations.

1

2

3

4

3 The MSC Standard uses scientific terminology to define three core principles.

(a) Principle 1 – Sustainable target fish stocks

Principle 2 – Environmental impact of fishing

Principle 3 – Effective management

The table contains descriptions of these principles.

In the end column of the table opposite write the number of the principle that is being described.

You may use each number once, more than once or not at all. [5]

Description	Principle
incorporates institutional and operational frameworks	
maintains the function and diversity of the ecosystem	
national and international laws and standards	
no overfishing or depletion of exploited populations	
the fishery must be conducted in a manner that leads to the recovery of populations	

- (b) The MSC certification process involves the collection, storage and sharing of environmental information.**

The Environmental Information Regulations 2004 (EIR) gives rights of public access to information held by public authorities.

- (i) Name ONE other piece of legislation which gives the same right of public access to information.**

[1]

- (ii) Legislation for the storage, use and sharing of environmental information will affect the level of public understanding and actions.

Suggest THREE ways that the public uses environmental information.

1

2

3

[3]

SECTION B

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

4 Scientific information has different levels of classification.

Use the following list of words to complete the sentences that follow.

You may use each word once, more than once or not at all. [4]

accountability	authentication
authorisation	availability
confidentiality	integrity
reassurance	regulation
reputation	responsibility

Some scientific information is more sensitive than other information and requires a higher level of

_____ .

As a result, different individuals within organisations are assigned with different levels of _____ to access more-sensitive data.

Even then, they can only access this type of data by providing further _____ usually in the form of a username and a password.

These security mechanisms and others aim to ensure the _____ of the data.

5 Liv Miller is an information systems security manager.

She works for a research and development company specialising in high-tech medical diagnosis equipment.

An example of the type of equipment produced is shown below.



Liv is responsible for training the company employees to use security protocols.

She outlines three targets for training:

Target A – modify employee behaviour

Target B – explain the consequences of non-compliance

Target C – analyse industry-specific case studies.

(a) Suggest TWO purposes of Target A.

[2]

- (b) (i) Identify the legislation that enforces compliance with security protocols.**

Put a tick (✓) next to the correct legislation. [1]

Copyright, Designs and Patents Act 1988

☐

Data Protection Act (DPA) 1998

☐

Information Commissioner's Office (ICO) codes of practice

☐

Protection of Freedoms Act 2012

☐

- (ii) Target B is also an important feature of the training.**

State a possible consequence for an EMPLOYEE of non-compliance with this legislation.

- (iii) State a possible consequence for the COMPANY of non-compliance with this legislation.**

[1]

(c) For Target C, the most effective case studies for security protocol training should identify three issues.

For each of the three issues listed, suggest TWO examples. [6]

Issue 1: types of risk

Example 1: _____

Example 2: _____

Issue 2: impact of risks

Example 1: _____

Example 2: _____

Issue 3: reduction of risks

Example 1: _____

Example 2: _____

- (d) Before beginning her training program, Liv consults the Employment Statutory Code of Practice.**

Section 17.71 states:

To avoid discrimination, employers should ensure that managers and supervisors who select workers for training understand their legal responsibilities under the Act.

Identify the name of the Act.

[1]

- 6 Aquaculture is the breeding, rearing and harvesting of fish, shellfish, plants, algae and other organisms in all types of water environments.**

The fish are maintained and harvested from floating offshore fish farms as shown below.



Andy Drakeford is a risk management surveyor. He works for a company that offers insurance policies to aquaculture businesses.

Andy is carrying out an assessment for a proposed offshore fish farm.

The farm will be monitored and controlled remotely from inland offices. For example, sensors will monitor the quality of the seawater.

This will provide the data needed for automated processes, such as dispensing food.

- (a) There are often data access issues when transmitting scientific information.**

Describe THREE main data access issues that Andy needs to consider in his assessment.

1

2

3

- (b) Andy needs to assess what measures are proposed to minimise the risks of the three offences identified in the Computer Misuse Act 1990.**

Identify these offences.

Tick (✓) THREE boxes opposite. [3]

access without permission e.g. looking at someone else's files

☐

access without permission with intent to commit further crimes

☐

allowing a computer to close down without saving data

☐

altering data without permission/installing a virus

☐

failure to check the accuracy of data before storage on a computer

☐

failure to save data correctly on a computer

☐

loss of a computer containing sensitive data

☐

- (c) Andy needs to assess the quality and robustness of the remote sensors used in the fish farm.**

He begins by considering what should happen if the information provided by the sensors is of GOOD quality:

- A The sensors provide a reading**
- B The reading is used to inform actions**
- C The operators have confidence in the reliability of the sensors**
- D The operators have confidence in the correctness of their actions**
- E The fish farm continues to operate with regulatory approval**

Identify the consequences of POOR information.

Write the correct letter (A, B, C, D or E) alongside each potential consequence. [5]

delusion

loss of reputation

misinformation

poor decision-making

stress/anxiety

- (d) Andy also considers the principles of information security when he assesses the proposed system for remote control of the fish farm.**

Which of the following features relate to the INTEGRITY of the system?

Tick (✓) THREE boxes opposite. [3]

it includes a mechanism to alert the operator in the event of unauthorised modification

☐

it is compatible with cloud storage

☐

it is compliant with ICO Codes of Practice

☐

it is compliant with recognised standards for encryption

☐

it is more difficult to intercept

☐

it protects data from unauthorised modification

☐

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional answer space is required, you should use the following lined pages. The question numbers must be clearly shown in the margins – for example, 2(a) or 3(b)(i).

This image shows a blank sheet of white paper with horizontal black ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.



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