Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel
International
Advanced Level

Centre Number | | | | | |

Candidate Number | | | | |

Tuesday 5 May 2020

Morning (Time: 2 hours) | Paper Reference **WIT11/01**

Information Technology

International Advanced Subsidiary/Advanced Level
Unit 1

You do not need any other materials.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- Calculators are **not** allowed.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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P 6 2 7 1 8 A 0 1 2 0

Pearson

Answer ALL questions.

Write your answers in the spaces provided.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 Gathii has a blog. He writes articles about wildlife photography for his blog. He has a large following and thinks he can make money from his blog.

(a) State **two** ways in which Gathii could monetise his blog.

(2)

1 .....

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2 .....

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(b) Gathii uses free cloud storage for his images.

His camera produces images that are 4000 pixels high, 6000 pixels wide, and use 12 bits per pixel for storage.

(i) Identify the expression that gives the size of a single image in mebibytes (MiB).

(1)

☒ **A** (4000 x 6000 x 12) / (1024 x 1024)

☒ **B** (4000 x 6000) / (12 x 1000 x 1000)

☒ **C** (4000 x 6000 x 12) / (8 x 1024 x 1024)

☒ **D** (4000 x 6000 x 12) / (8 x 1000 x 1000)

(ii) Gathii wants to upload 100 MiB of images to the cloud storage site.

The site restricts uploads to a maximum of 256 kilobits per second.

Identify the expression that gives the minimum time needed for the images to be uploaded.

(1)

☒ **A** (100 x 1024 x 1024) / (256 / 8 x 1000) seconds

☒ **B** (100 x 1000 x 1000) / (1024 x 1000) seconds

☒ **C** (100 x 1024 x 1024) / (8 x 1000) seconds

☒ **D** (100 x 1000 x 1000) / (0.256 x 1000) seconds

(c) Gathii uses free cloud storage for his images.

Explain **one** benefit and **one** drawback to Gathii of using free cloud storage.

(4)

Benefit

Drawback

(d) Gathii is a member of an international photography forum.

One benefit of being a member of the forum is that Gathii can make posts about his blog.

Describe **two other** benefits to Gathii of being a member of the forum.

(4)

1

2

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(e) Gathii's blog and the cloud storage sites are part of the world wide web.

One of the main features of the world wide web is hypertext.

Explain what hypertext is.

(3)

(Total for Question 1 = 15 marks)

2 (a) A botanic garden uses quick response (QR) codes to label trees so that visitors can view information about them using a QR scanner.

Figure 1 shows an example of a QR code.

Figure 1

The pattern of squares holds data that displays as text when read by a scanner.

All QR codes include additional information that enables a scanner to read them.

State **three** items of additional information included in a QR code.

(3)

1 .....

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2 .....

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3 .....

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(b) The botanic garden sells plants in its own shop.

The shop attaches a passive radio-frequency identification (RFID) tag to each plant.

(i) Describe how passive RFID tags work.

(4)

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(ii) One use of RFID tags is to help reduce theft.

Give **one other** way that the shop could make use of the RFID tags on the plants.

(1)

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(c) Visitors to the botanic garden can pay the entry fee by using a near-field communication (NFC) card.

(i) Describe **two** security risks of using NFC transmission for this purpose.

(4)

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(ii) Explain **one** method of protecting the data being transmitted by NFC.

(2)

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(Total for Question 2 = 14 marks)

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QUESTION 3 STARTS ON THE NEXT PAGE.

3 A railway museum consists of two buildings and several outdoor exhibition spaces.

The museum layout is shown in **Figure 2**.

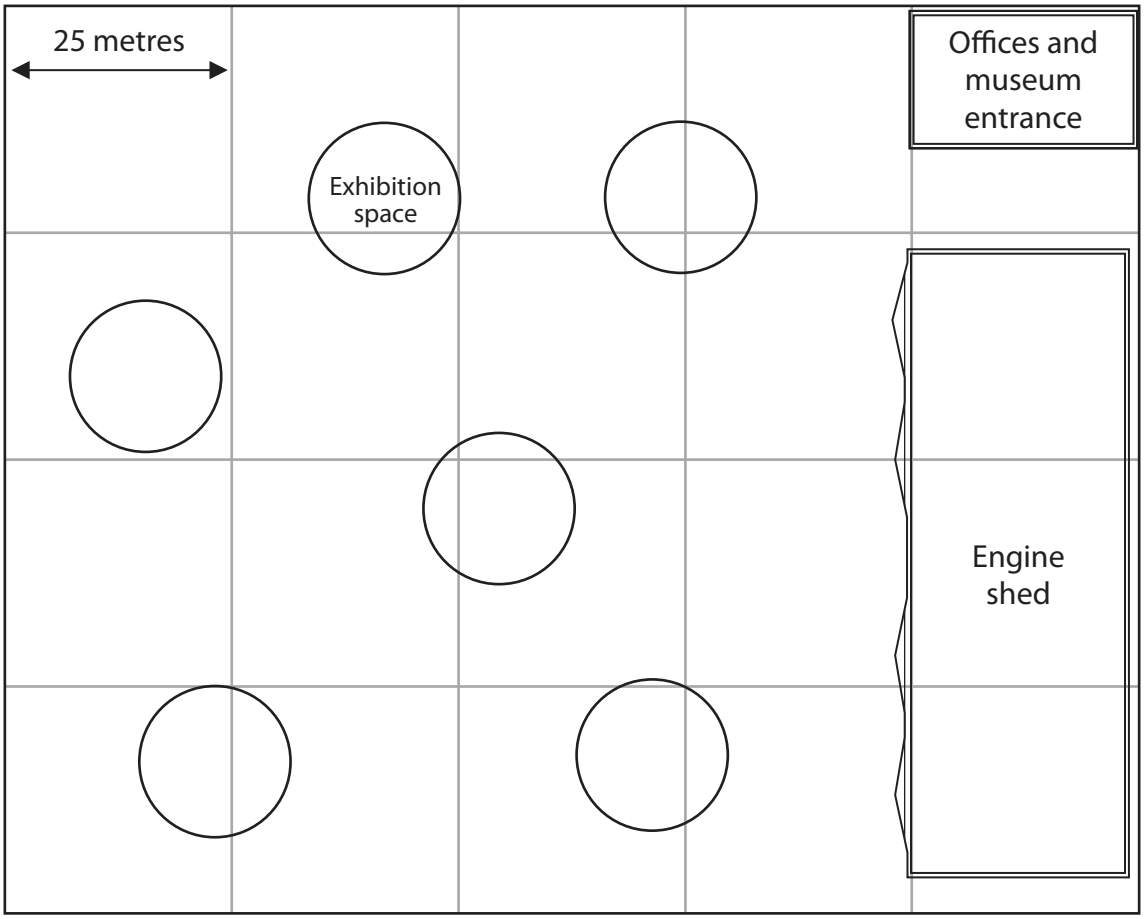


Figure 2

The engine shed, and outdoor exhibition spaces contain a variety of railway-related items.

The museum wants a new network to provide extra facilities for visitors.

The design brief states that the network must:

- provide Wi-Fi for visitors
- have interactive touch screens in the engine shed and outdoor exhibition spaces
- allow museum staff to control the screens from the museum offices
- allow the content being displayed to be altered from the museum offices
- be robust and have minimum risk of outside interference.

(a) Draw and label a network diagram that will meet the design brief.

Represent a wireless connection by a line of dashes.

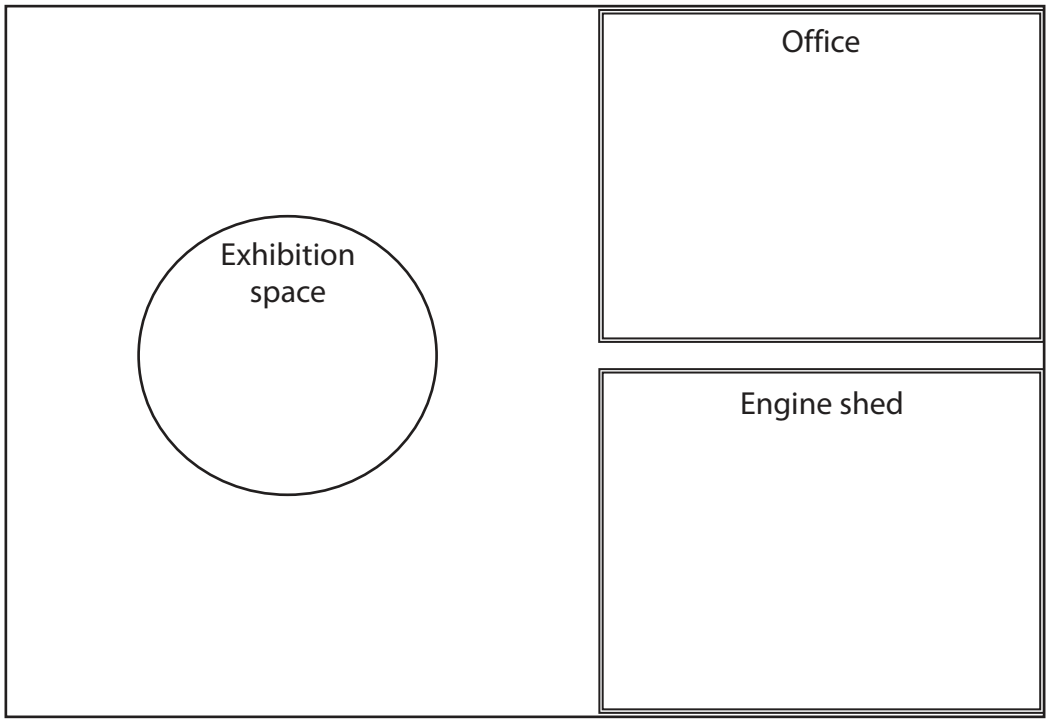
Represent a cable connection by a solid line.

Indicate the cable type(s) to be used.

Use this simplified layout of the museum to draw your diagram.

You need only show one of the exhibition spaces.

(6)



(b) The museum staff are concerned that hackers might gain unauthorised access to the system via the internet.

Explain what measures could be taken to reduce the threat of hackers from the internet.

(6)

(Total for Question 3 = 12 marks)

4 A school is designing a database to record details of its students and the subjects they study.

A student can study many subjects.

A teacher can teach many classes.

A class is taught by one teacher.

These five entities will be used in the database:

Student (Last name, First name, StudentID, Date of birth)
Subject (SubjectID, Subject title)
Teacher (TeacherID, Last name, First name)
Class (Start date, TeacherID, End date, SubjectID, Room number, ClassID)
Class registration (ClassID, StudentID)

(a) Here is a partially completed entity relationship diagram for this database.

Complete the diagram to show:

- primary keys, underlined
- composite primary keys, underlined
- foreign keys, with an asterisk
- relationships.

(6)

Student

Teacher

Class_registration

Class

Subject

(b) The school database will hold structured data.

Discuss why a relational database is suitable for handling structured data.

(6)

(Total for Question 4 = 12 marks)

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QUESTION 5 STARTS ON THE NEXT PAGE.

5 A transport company runs bus services on several routes in a large town.

The company has an IT system that provides passenger services at bus stops including:

- a scrolling display that gives details of the next three buses that are due to arrive
- a contactless card terminal with a touch screen that allows a passenger to add credit to and/or check the credit remaining on a card and displays the transactions.

Displays and transactions are handled by the company's server.

Real time information for each bus's location is produced by:

- buses connecting to the company by 3G signals
- buses reporting their current location as they pass each bus stop.

(a) Draw a dataflow diagram for the IT system.

(12)

(b) Explain why a dataflow diagram is useful when planning an information system.

(3)

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(Total for Question 5 = 15 marks)

6 A scrap metal company wants to extend its business into the disposal of IT equipment.

Some of the company's directors think they make most profit by shredding everything and using a furnace to extract the metals that are then sold. This is the shred and smelt system.

Others believe that they will make more profit by adopting a reuse and recycle system that involves selling items and/or parts second hand.

Evaluate the advantages and disadvantages of a reuse and recycle system compared to the shred and smelt system.

Your evaluation should include:

- environmental considerations
- data security implications
- your conclusion.

(12)

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 80 MARKS

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