Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International Advanced Level

Wednesday 29 May 2024

Afternoon (Time: 2 hours)

Paper reference **WIT13/01**

Information Technology

International Advanced Level
UNIT 3

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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F:1/1/1/1

P 7 5 8 7 8 A 0 1 2 0

Pearson

Answer ALL questions. Write your answers in the spaces provided.

1 There are many technologies available to store, protect and process data.

(a) Data can be stored in the cloud.

(i) Explain **one** reason to store data in the cloud.

(2)

(ii) Data stored in the cloud may be protected by firewalls and encryption.

Explain **one other** way that cloud storage is secured

(2)

(b) Data is entered into and processed using online forms.

(i) Here is a date of birth entered into an online form.

05-05-2010

Explain how this date of birth can be **both** valid and inaccurate.

(2)

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(ii) A student is registering at a tutoring website for AS- and A-Level subjects.

Figure 1 shows part of the web page for registration.

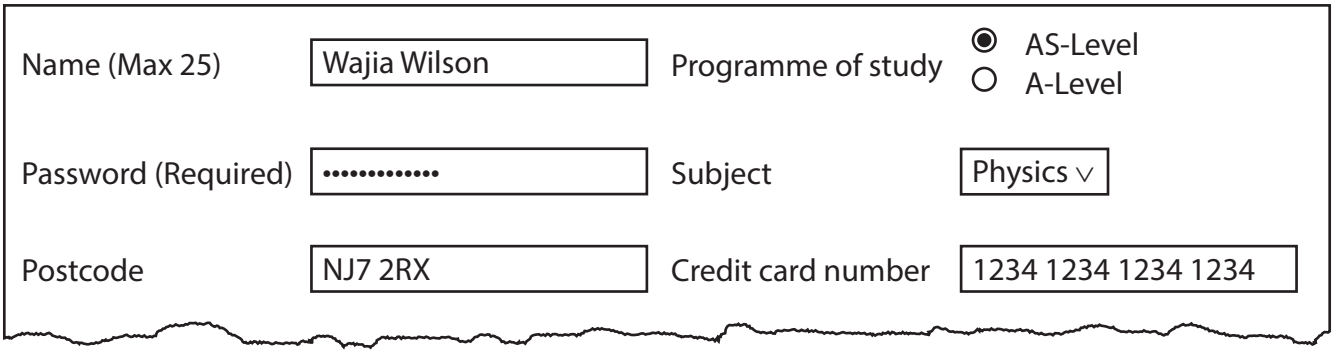

Figure 1

Complete the table to identify the type of validation required for each input item.

Use each type of validation only once.

(6)

Input item	Validation required
Name	
Password	
Programme of study	
Subject	
Credit card number	
Postcode	

(Total for Question 1 = 12 marks)

2 Ambulance technicians undertake many different types of training.

(a) The ambulance technicians can interact with devices in different ways.

Complete the table to give the type of human computer interaction shown in **each** image.

(4)

Image	Type of human computer interaction
	
	
	
	

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(b) One type of training is for cardiopulmonary resuscitation (CPR).

CPR is a procedure used when a person stops breathing or their heart stops.

CPR forces blood and oxygen to keep flowing through the body.

Figure 2 shows CPR training using a dummy.

Figure 2

Look at **Figure 2** and consider how augmented reality could be used in the training.

Describe **one** way that augmented reality could be used during CPR training to make training more effective.

(2)

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(c) The training provider allows the ambulance technicians to stay at home to learn the theory parts of the course. The technicians log onto virtual machines to read the theory materials and answer multiple-choice quizzes.

Give **two** benefits to the training provider of using a virtual machine to deliver online training.

(2)

1 .....

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2 .....

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(d) Speech recognition, natural language processing and expert systems are types of artificial intelligence.

Complete the table to name which **one** of these types of artificial intelligence is used in **each** situation.

(6)

Situation	Type of artificial intelligence
Technicians use voice-operated devices to give the location of an incident.	
Technicians wear bodycams that record incidents. A computer program transcribes the audio to a text document before it is stored on a server.	
Technicians supply the symptoms of a patient to a computer program. The program diagnoses a heart attack.	
Technicians attend a conference at the end of their training. Transcripts of panel discussions are produced by a computer program.	
Technicians input an image of a spider to a computer program. The program indicates that the spider is venomous.	
Technicians use a computer program to communicate with patients who do not speak English.	

(Total for Question 2 = 14 marks)

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3 A retailer uses a database management system (DBMS) to manage employees, customers, orders and deliveries.

(a) The database is distributed across locations.

The distributed database management system uses data replication.

Give **two** reasons for using data replication.

(2)

1 .....

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2 .....

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(b) Drivers deliver orders to customers.

The database has a customer table and an order table.

Describe how the information needed to produce a delivery note for the driver can be generated from the database.

(2)

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(c) **Figure 3** shows part of a completed form for a new employee.

Office use only		ID: 9876543	
Last name	Schreck		
Telephone	0426452774	Date of birth	18-05-1990
Do you drive? (y/n)		Y	
Accident free (whole years)		8	

Figure 3

Complete the data dictionary for the employee part of the database.

Employee IDs are automatically allocated sequentially.

Telephone numbers use the standard format shown.

(6)

Name	Data type	Size	Required	Comment
empID				
lastName			Yes	
phone				
dob				
drive				
accidentFree				

(Total for Question 3 = 10 marks)

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QUESTION 4 BEGINS ON THE NEXT PAGE.

4 A financial institution provides credit cards.

(a) Applicants for credit cards complete an online form.

A machine learning algorithm determines if the application should be rejected, approved or investigated further.

Describe how the machine learning algorithm can be trained to identify the outcome of each application.

(2)

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(b) Financial institutions use Big Data to make decisions.

Discuss how a financial institution could obtain, store and use analytics on Big Data.

(6)

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(c) A customer pays the balance of a credit card account using Bacs Payment Schemes.

Figure 4 shows a credit card account statement.

The full balance must be paid.

XYZ Bank

Credit card account

Robin Redmond
120 Leeming Street, Tidchester TD1 5WP

Account number	**Sort code**	**Statement date**
12345678	12-34-56	01 August 2018 to 31 August 2018

Date	**Description**	**Spend**	**Payment**	**Balance**
01 Aug 2018	Opening			783.35
	Total spend	456.12		
	Total payments		783.35	
31 Aug 18	Closing balance			456.12

Bacs payments: Account number 99875234 Sort code 17-18-19

Figure 4

The payment transfer takes up to three full days.

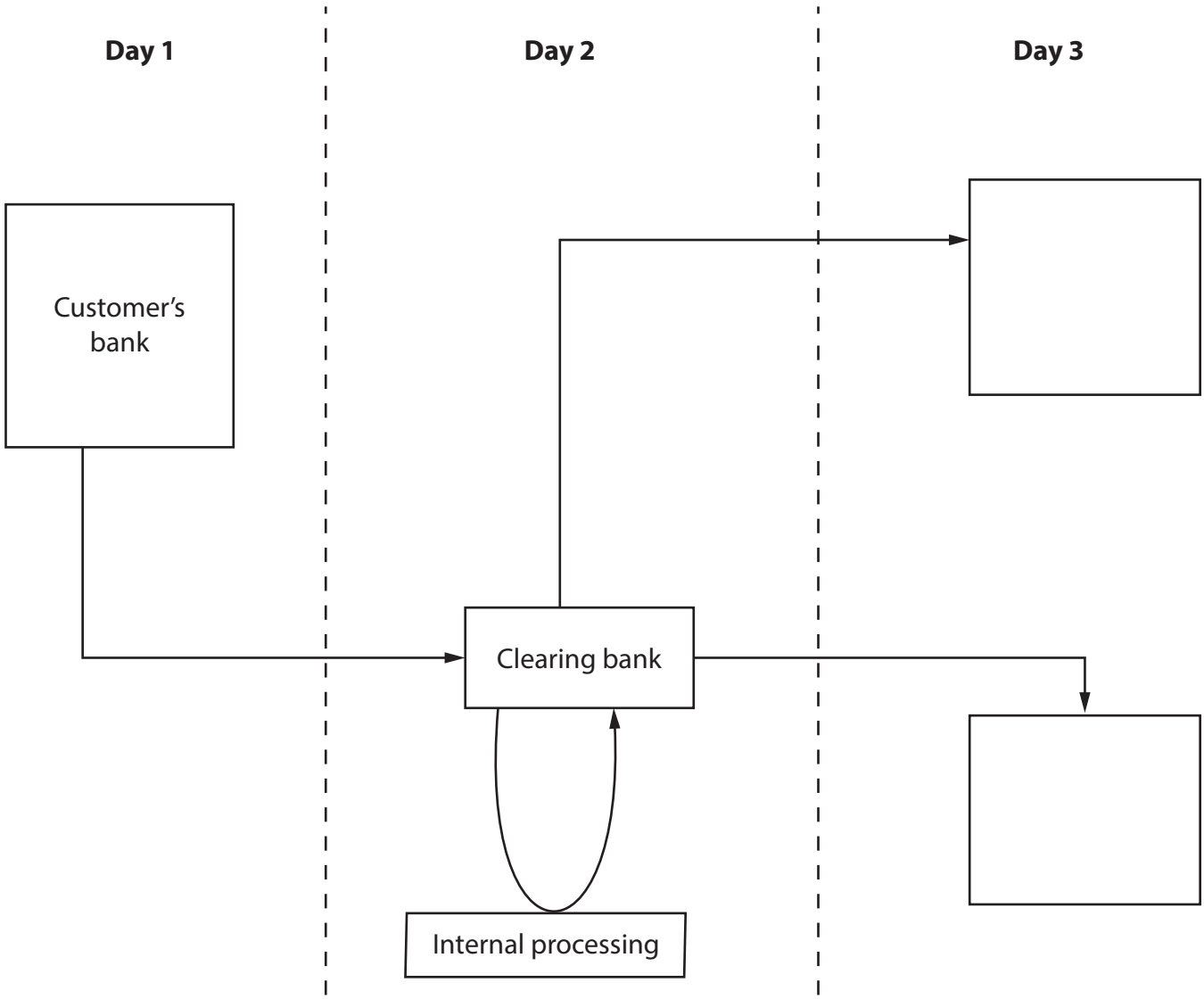
The transfer involves three different banks: the customer's bank, the credit card company's bank and a clearing bank.

The clearing bank acts as a go between. It needs one day for its own internal processing.

The customer needs to pay the credit card company the balance owed.

Complete the information flow diagram to show the destinations and information flows for the payment transfer.

(10)



(Total for Question 4 = 18 marks)

5 A college has 4,000 students and 250 members of staff.

College staff are full-time or part-time employees. Some staff are trained in first aid.

Students are required to register for each class. Attendance is monitored closely.

The college has a library. An annual project reports on library stock, usage and spending.

The college cafeteria sells snacks and meals. An ongoing project is monitoring and ordering of supplies.

Evaluate the benefits and drawbacks for the college of using a management information system (MIS).

You could consider:

- record keeping
- decision making
- project management
- issues of implementing a management information system (MIS).

(12)

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(Total for Question 5 = 12 marks)

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QUESTION 6 STARTS ON THE NEXT PAGE.

6 Internet of Things (IoT) devices are used for many purposes.

(a) A smart oven scans a quick response (QR) code on a product label to automatically set the temperature and cooking time for the product.

No user input is required.

Describe **one** way that this smart oven presents a security risk to the user's data.

(2)

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(b) Farm equipment monitors moisture levels, air temperature, soil temperature and wind speeds.

Explain **one** way the farmer can make use of the data collected to improve the harvest.

(2)

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(c) The makers of a range of wearable IoT devices are demonstrating their products at a trade show.

On the opposite page are:

- a partially completed precedence table for setting up the equipment
- a partially completed activity on arc network diagram representing the precedence table.

Complete the precedence table by:

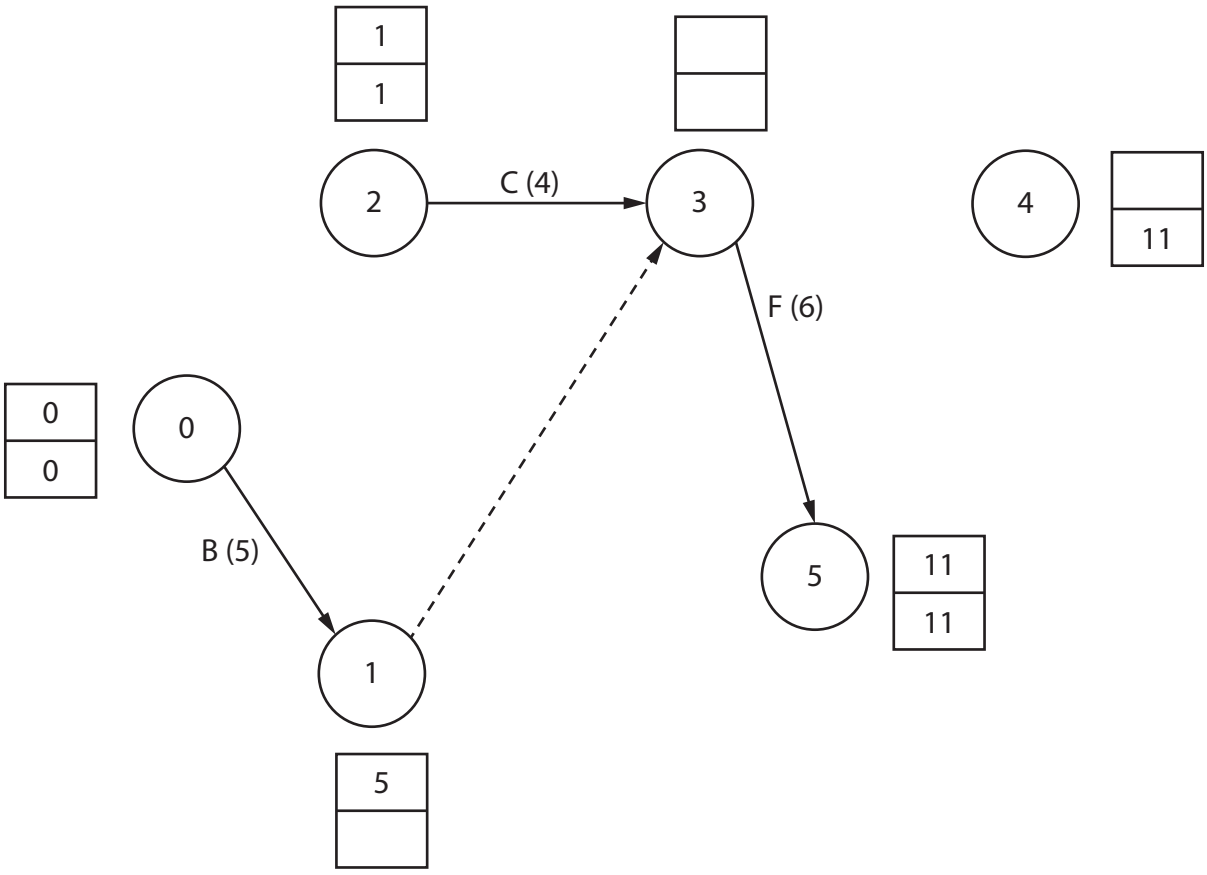
- adding the values for the predecessors of activity F.

Complete the activity on arc network diagram by:

- adding and labelling **three** arrows
- adding **one** dummy arrow
- adding **four** missing values for the early and late event times.

(10)

Activity	Task	Duration	Predecessor
A	Unpack and set out wearables	1	–
B	Ensure tablets are working with trade show Wi-Fi	5	–
C	Ensure wearables are working with trade show Wi-Fi	4	A
D	Accept online terms and conditions for trade show Wi-Fi usage	2	B
E	Test wearable statistics are updated on tablets	3	B, C
F	Test historical graph matches on tablets and wearables	6	



(Total for Question 6 = 14 marks)

TOTAL FOR PAPER = 80 MARKS

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