

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson Edexcel**  
**International**  
**Advanced Level**

Centre Number

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Candidate Number

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**Monday 1 June 2020**

Morning (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.
- Calculators are **not** allowed.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

### 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 4 4 5 5 R A 0 1 1 6



Pearson

**Answer ALL questions.**

**Write your answers in the spaces provided.**

**1** A web hosting company hosts websites using virtualisation.

Each website is hosted on its own virtual machine.

This virtual machine is known as a virtual server.

(a) One of the reasons for the web hosting company using virtual servers is economic.

(i) Give **two** ways in which using virtual servers can save money for the company. (2)

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(ii) Give **two other** reasons why the company hosts the websites on virtual servers. (2)

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(b) Another method of achieving virtualisation is to use containers.

Give **three** ways in which a container differs from a virtual machine. (3)

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(c) Many of the websites hosted by the company belong to individuals.

The websites are hosted in the cloud.

Two advantages of using cloud storage is that the website owners have more secure and flexible storage of their data.

Explain how secure and/or flexible storage is achieved in this context.

(4)

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**(Total for Question 1 = 11 marks)**



P 6 4 4 5 5 R A 0 3 1 6

2 A company runs a large chain of grocery shops.

(a) The company uses a management information system (MIS) to store and analyse financial data from all the shops. This information is used to prepare reports for external agencies, such as tax authorities.

Describe **two other** ways in which the company could use the MIS.

(4)

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(b) The company uses an intelligent transportation system (ITS) to help manage its fleet of delivery vehicles.

Describe **two** ways in which an ITS can be used to manage the fleet.

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(c) The company uses a transaction processing (TP) system in its shops.

Discuss how the use of a TP system benefits the company.

(6)

Area with horizontal dotted lines for writing the answer.

**(Total for Question 2 = 14 marks)**



P 6 4 4 5 5 R A 0 5 1 6

3 A company manufactures coffee machines for use in the home. It wants to introduce a range of smart machines that have a WiFi connection. This will make the machines part of the Internet of Things (IoT).

Owners of the new machines will be able to:

- operate their machine via an app
- receive alerts when their machine needs more coffee or other supplies
- receive reports about their machine's operation
- permit their machine to automatically order coffee or other supplies.

The machines will be able to:

- send statistical data to the company about usage
- receive firmware updates
- order coffee or other supplies if permitted to do so.

IoT devices have a history of using weak or no security measures.

Evaluate the impact of weak IoT security measures on individuals, organisations and data in the context of the new coffee machines.

Your answer should include a conclusion about the security measures the company should use.

(12)

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**(Total for Question 3 = 12 marks)**



P 6 4 4 5 5 R A 0 7 1 6

4 A company operates several car parks in a city.

Car park attendants collect parking fees at the entrance to each car park.

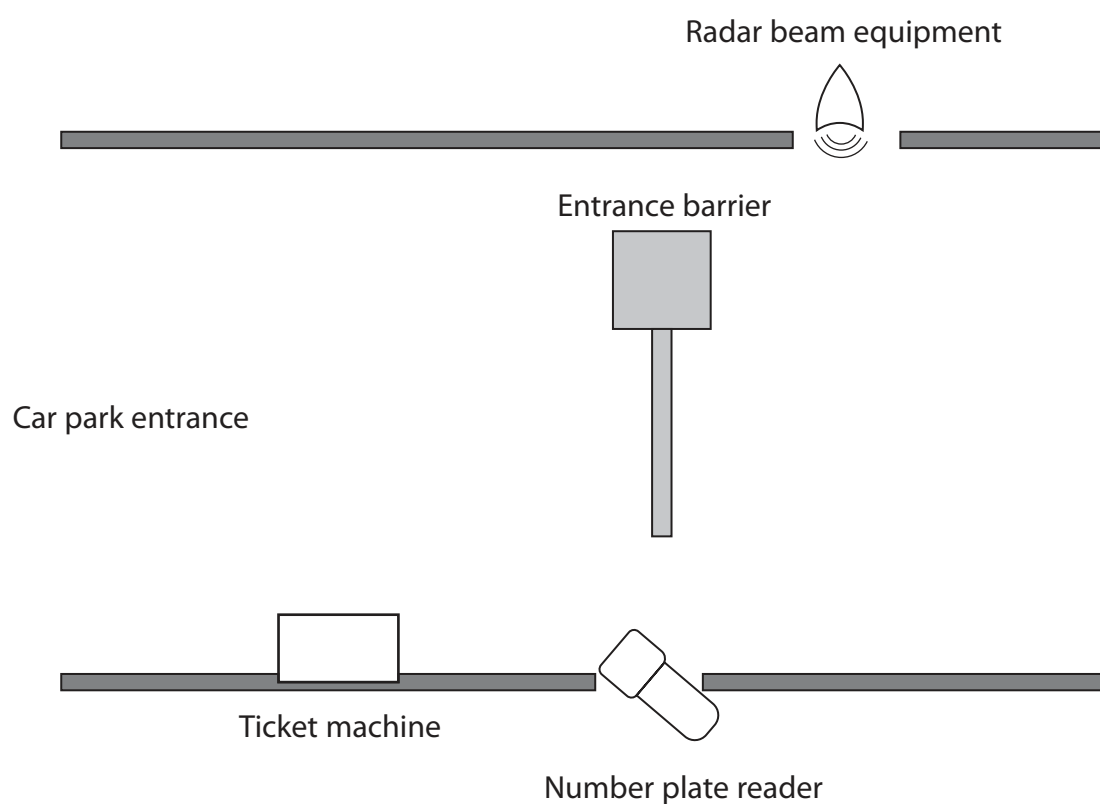
The company wants to replace this manual system with an automatic one.

(a) Each car park will have a computer to control the system.

The entry system will consist of:

- an entrance barrier that can be raised to allow a car in
- a number plate reader that records the car's registration
- a ticket machine that issues a ticket with the time of entry and the car's registration
- a radar beam that detects when the car has cleared the entrance barrier.

This is shown in **Figure 1**.



**Figure 1**





The entry process is:

1. When a car stops at the barrier its registration number is read and the information is sent to the computer.
2. The computer sends the registration number and current time to the ticket machine.
3. The ticket machine prints a ticket and pushes it out of a slot.
4. When the driver takes the ticket the barrier rises.
5. Once the car passes through the radar beam the barrier falls.

Create an information flow diagram to describe this process.

(6)

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(b) The company intends to use the pilot changeover method to change from the manual to the automated system.

Discuss the benefits and drawbacks of using the pilot changeover method in this context. (6)

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**(Total for Question 4 = 12 marks)**



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- 5 Carlo is designing a relational database. As part of the process he will create a data dictionary.
- (a) Data dictionaries can be active or passive.

Explain how an active data dictionary differs from a passive data dictionary when the database is running.

(3)

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- (b) One of the functions of a data dictionary is to hold information about the data objects in the database (metadata).

Describe **two other** functions of a data dictionary.

(4)

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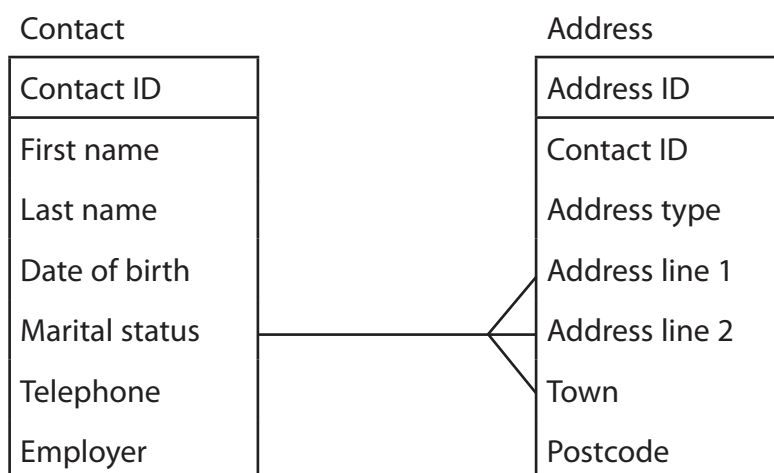
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(c) Part of Carlo's database deals with contacts.

**Figure 2** shows a logical data model for the contacts part of the database.



**Figure 2**

Carlo has also made some notes about the data.

- Marital status, create list: Married, Single, Divorced, Widowed
- Date of birth in format DD/MM/YYYY
- Date of birth to be validated to check age is at least 18 years
- These fields must be filled:  
Contact ID, First name, Last name, Telephone, Address ID, Address type,  
Address line 1, Postcode

Create a data dictionary for the contacts part of the database.

(9)



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Table name						
Attribute / field name	Data type	Key (P/F)	Reqd (Y/N)	Field size	Description / notes	

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Attribute / field name	Data type	Key (P/F)	Reqd (Y/N)	Field size	Description / notes	

(Total for Question 5 = 16 marks)



- 6 A publishing company wants to sell a box set of an author's work. This will be six books, presented in a specially designed box.

Shehani is in charge of this project and has worked out a six-week schedule.

She was told yesterday that the launch event will now be in three weeks' time. This will be followed by book signing events around the country.

Shehani has read that critical path analysis (CPA) is a project tool that can make best use of the time available. She has not used CPA before, but has decided to use it to reschedule the project.

Shehani has produced a list of tasks and estimated durations.

Number	Task description	Duration (days)	Notes
1	Project start-up meeting	1	Meet tomorrow
2	Write promotional material	7	Can start after start-up meeting
3	Produce artwork for boxes, book covers and promotional material	10	Can start after start-up meeting
4	Select book signing venues	5	Can start after start-up meeting
5	Produce boxes	6	Must have artwork
6	Print promotional material	2	Must have artwork and written promotional material
7	Print the books	6	Must have artwork
8	Packaging and distribution	3	Needs books and boxes
9	Hold launch event	1	Needs books, boxes and promotional material
10	Hold book signing events	14	Start day after launch event



(a) Create a critical path analysis diagram for the project that identifies the shortest time for Shehani to complete the project.

(9)

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(b) Shehani has not used CPA before.

Discuss the benefits and drawbacks of Shehani using CPA for the project.

(6)

Dotted lines for writing the answer.

**(Total for Question 6 = 15 marks)**

**TOTAL FOR PAPER = 80 MARKS**

