Chapter 1

Exercise 1.1

1 C

2 Information = data + meaning

Information and data may superficially look the same but we do not know how to interpret data whereas we know the meaning of information.

3 Hardware is equipment and devices making up a computer system. It is a physical object.

4 The diagram should include as a minimum: a system unit including a DVD drive, a monitor, a printer, a scanner, an Internet connection, a keyboard and a mouse. You could also show other attached devices, for example: a webcam, a digital camera and a PDA.

5 Similarities:

- Both are computers and so have similar components.

Differences:

- A laptop is built to be portable whereas a desktop is not.
- A desktop computer could be much larger than a laptop.
- A laptop can be battery powered whereas a desktop computer is usually mains powered.

6 Similarities:

- Both are computers and so have similar components.

Differences:

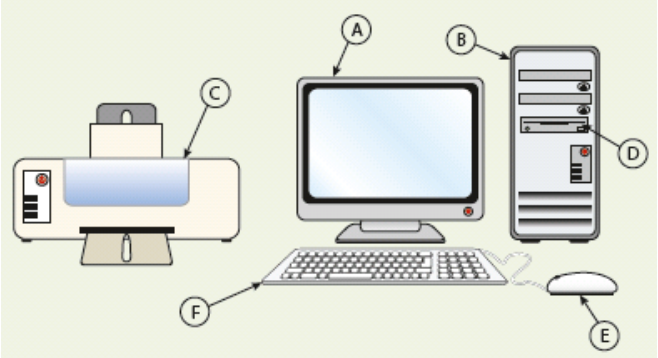
- A hand-held is built to be portable and may be carried in your pocket whereas a desktop is not.
- A desktop computer is much larger than a hand-held.
- A hand-held can be battery powered whereas a desktop computer is usually mains powered.
- A hand-held could be part of a multifunction device including a PDA or smart phone.

7 A PDA user can benefit from having an external keyboard because if a PDA has a keyboard, it will have very small keys and be difficult to use. An external keyboard is likely to approach full size and this will make it easier to use and especially to touch type.

8 'PROCESS' would be teaching; 'INSTRUCTIONS' would be the school rules and policies; 'FINAL OUTPUT' would be the education of pupils including their achievements in International GCSE examinations.

Exercise 1.2

1



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a)

Label	Name
A	Monitor
B	System unit
C	Printer
D	DVD drive
E	Mouse
F	Keyboard

b) Parts of the computer used for input: E, F

c) Parts of the computer used for output: A, C

d) Parts of the computer used to:

- Type a letter: F
- Draw a picture on the screen: E
- Print a report: C

2 Input devices used to point on the monitor screen: a mouse, a touchpad, a roller ball and a stylus or finger on a touch screen. Different pointing devices are needed because:

- Different users have different preferences and find different devices easier to use.
- A touchpad is always available if built into a laptop; whereas a mouse is easier to use and will be used with a desktop where portability and space are not problematic.
- People can always use their finger to point at a touch screen, but may not have a stylus or mouse.

3 For example:

- A keyboard is used to type in data.
- A microphone is used to record sound including speech.
- A webcam is used to record video. For example, for visual communication using Skype.

4 For example:

- A laser printer takes longer to print the first page but will print long documents faster than an ink jet.
- A colour laser printer is likely to be much more expensive to purchase than a colour ink jet printer.
- Laser printers usually produce higher quality printouts than ink jet.

5 A computer needs speakers so that users can listen to sound being output. For example, as part of a downloaded video.

6 For example:

- A printer; used to produce output printed on paper; usually connected to the system unit.
- A monitor; used to view output while interacting with the computer; usually connected to the system unit.

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7 For example: Preprinted stationery is used for letters. These could have the name of the company and contact details preprinted. The secretary then uses a laser printer to add the body of the letter.

8 A games console is predominantly an input device. It will have buttons and joysticks built into it and these are input devices. However, some games consoles are also output devices. For example, they may vibrate when an onscreen event such as a crash happens.

9

Device	Input, processing or output
Button	Input
Bleeper	Output
Red light	Output

10 Advantages of multifunction printer:

- A multifunction device is likely to take up less space on the desk top than three separate devices.
- Only one ink cartridge is needed but this will need more frequent replacement.

Disadvantages of multifunction printer:

- If a separate printer breaks down then only that device is out of use and needs to be repaired or replaced.
- If it is part of a multifunction device then the whole device is affected.
- At least two ink cartridges are needed.

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Chapter 2

Exercise 2.1

1 D – 1 Gbyte = 1024 Mbytes so 2 CD-Rs are needed

2 D – assuming each DVD stores 4.7 Gbytes of data

3 A storage medium is the material data is stored on. For example, a DVD disk. A storage device is the hardware device that is used to access the storage medium. For example, a DVD drive.

4 For example:

- Both are used for backing storage.
- A hard disk may be built into the system unit of a desk top computer whereas a USB memory stick is portable.
- An external hard disk will be portable but physically much larger and heavier than a USB memory stick.
- In operation, a hard disk rotates whereas USB memory stick has no moving parts.

5 For example:

- A hard disk is rewritable whereas a DVD is often finalized as soon as data has been written to it.
- A hard disk is read using magnetic technology whereas the data on a DVD is read using optical technology.
- A hard disk is usually built into the system unit, as is a DVD drive, but a DVD is removable.

6 Serial access to a magnetic tape can be a disadvantage because it can take a long time to find a specific item of data if you don't know which part of the magnetic tape it is stored on. Magnetic tape is often use to backup large volumes of data.

7

- Backing storage is not 100% reliable and data is sometimes corrupted. Backups are needed so that users can recover at least some of the data lost.
- A small business might take a backup overnight and so is unlikely to lose more than one day's work.
- Backups could be stored online; then in a fireproof safe onsite; then in a fireproof safe offsite.

8

- Main memory and a hard disk are both used to store programs and data.
- Main memory has a lower storage capacity than hard disk.
- Main memory stores programs while they are being executed and data while it is being processed. In contrast, a hard disk can only store copies.

9

- Both are used to store programs and data.
- Main memory stores programs while they are being executed and data while it is being processed. In contrast, flash memory can only store copies.
- Main memory is volatile but flash memory is non-volatile.
- Main memory is built into the system unit. There could be some flash memory built into the system unit but it is most likely to be used in portable backing storage devices, such as USB memory sticks.

10 A word is the amount of data that a computer can directly access at one time. Different computers can access one, two, four or more bytes of data at one time. A byte is a combination of eight signals, each of which can be either off or on (0 or 1). Each of these signals is a Binary digIT or bit, so each byte has eight bits. If the computer reads four bytes at once then its word length is 32 bits.

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Chapter 3

Exercise 3.1

1 C – Desktop Publishing software

2

Task	Type of software
Write an essay for homework	Word processing
Send an e-mail to a friend	Email client, e.g. Microsoft Outlook, or webmail
Look for information about mobile phones on the Web	Web browser
Remove the buzzing at the start of some music you have recorded	Audio editing software
Make a film about your holidays	Video editing software

3 For example: Microsoft Paint. You can create and edit bit mapped images.

4 For example: Microsoft PowerPoint. You can create and edit a slide show.

5 For example:

- Microsoft PowerPoint. You can create and edit an interactive information kiosk.
- Microsoft Access. You can create a system to regulate book loans from a library.
- Adobe Photoshop. You can optimize the size of images for display on a website.

6

- Microsoft Works includes word processing software, a spreadsheet, a calendar, a database and a project planner.
- OpenOffice includes software for word processing, spreadsheets, presentations, graphics, databases and more.

7 General-purpose software, in contrast to specialised software, can be used for a variety of tasks but must be set up or customized before use.

8 Off-the-shelf software means you can walk into a shop, take the software package off the shelf and buy it.

9 Advantages:

- Custom written or proprietary software is created to meet the needs of a particular business or individual. You get what you want, whereas off-the-shelf software may not meet all your needs.
- You have closer control over what custom written software is capable of. You can extend the features of custom written software but you can only use the features already available in off-the-shelf software.
- A custom written program produced for a specific purpose may run faster, because its code is optimised to serve that one purpose only.

Disadvantages:

- Custom written software takes time to develop whereas off-the-shelf software is available immediately.

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- The cost of development for custom written software is likely to be higher than the price of off-the-shelf software.
- A custom written package is essentially new, since it has only just been produced. An off-the-shelf package may have been around for some time – other people will have used it, so you can learn from them about its strengths and weaknesses. You cannot fully assess custom written software beforehand.
- You may have to spend some time training staff to use custom written software as it will not be like other software, whereas off-the-shelf software tends to be widely used and easy to use so that there are usually a large number of people who are already familiar with it.

10 For example: A program for preparing and printing business cards.

Quick question

- The sub folders of the folder **games** are: pilot, wartanks, killers and daggers.
- Assuming the root is the E: drive, the pathname is: E:/child1/games/wartanks/tanks.exe

Exercise 3.2

1 B – Spreadsheet. Microsoft Excel may use the .xls file extension.

2

Filename	Type of software
agenda.doc	Word processing
index.htm	Web browser
myfamily.jpg	Graphics
song.mp3	Media player or audio player
holiday.mp4	Media player or video player

3 In Figure 3.8, if the file council.doc is stored in the business folder on a memory stick in drive G:, the full path name of council.doc is: G:/father/business/council.doc

4 The answer to this question depends on what you use ICT for.

5 For example: Microsoft Windows Media Player displays the error message 'C00D0FAA: Cannot copy the files' when there is no compatible MP3 encoder installed on the computer.

6 The operating system could queue the printed output and print one followed by the other.

7 In Word, in the Insert menu, select Hyperlink, and the Insert Hyperlink dialogue box will appear. This can be used to insert a Hyperlink to website in a Word document.

8 In Windows, on desktop, double click on the My Computer icon. If the external hard disk is shown as drive F:, select F: and right click; and in the menu, select Format.

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9

- Open a window which shows the file on the hard disk.
- Open a window which shows the contents of the memory stick.
- Drag the file from the window on the hard disk to the window on the memory stick and drop it.

10

- Licensed software is sold. Purchasers buy the rights to use the software. These rights are typically one or more of: the right to use the software on one or more standalone computers; the right to distribute the software over a network for use on a specified number of network stations; and a site licence, giving the right to distribute and use the software on any computer on a particular site.
- Public domain software is free software. The owners of the software make it available to anyone who wants to use it, or specific groups of users, at zero purchase cost. Software producers may place any restriction on the use of the software that they wish. Even so, most public domain software carries no restrictions on its use.
- Shareware is licensed software that is initially distributed freely in the manner of public domain software. Users may install the software and try it out. However, if they decide to make regular use of the software they must pay a licence fee. Users sometimes receive improved versions of the software when a licence fee is paid. Where the licence fee is not paid, use of the software is illegal.

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Chapter 4

Exercise 4.1

1 The name of the word processing software you use depends on your personal usage.

2 D – Primary key

3 You need to give a file a name so you can identify it when you need it later. If you don't do this, either the operating system will block you from saving the file or the software will generate an automatic default filename which you may not recognise later.

4
- When you select Save, the open file is saved with its current filename.
- When you select Save As, you have the opportunity to rename the file.

5 Use the online support material for this question.

Exercise 4.2

Use the online support material for this exercise. Your answer to Exercise 4.2 should look like this:

Tobago

Tobago is considered one of the jewels of the Caribbean. Nature lovers and visitors alike can experience the unspoilt lush tropical vegetation that abounds on the island, which is also filled with a wide variety of birds and wildlife.

Tobago is a small island located approximately 22 miles north east of Trinidad. The population is about 50 000 and consists mainly of descendants of African slaves brought to work the sugar plantations in the 17th century. The native language is English and the majority of the population are Christians. The people of Tobago are warm and friendly.

The surrounding white sandy beaches with their blue Caribbean waters are ideal for relaxation and bathing. For the adventurous at heart there is an abundance of water sports such as surfing, scuba diving and kayaking, just to name a few. The famous Nylon Pool is found in the waters off Store Bay. This is a safe bathing area with clear blue water and is located on a sand bank about a mile from the shore. Not too far off is one of the largest barrier reefs in the world, filled with a wide variety of colourful tropical fish.

The local cuisine in Tobago is truly delightful. A visitor can choose from a wide variety of local and international dishes. Some of the favourite local dishes are curried crabs and dumpling, curried goat and the ever popular bake and fry fish.

Your name and the date here.

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Exercise 4.3

Use the online support material for this exercise. Your answer to Exercise 4.3 should look like this:

Sports and Cultural Club

13th December 2009

The Manager,
Zenith Oil Company Sports Club

As you are aware the present executive has reviewed the accounting and budgeting procedures. In order to promote transparency and proper accounting and record keeping, the following systems will now be implemented.

Cash List Form

This form will be used to record all petty cash transactions.

Fund Raising Form

This form will be used to inform the executive of all fund raising details.

Approved Budget 2010/2011

The items listed below have been approved for the budget:

- Cricket bats
- Pair cricket pads
- Table tennis rackets
- Soccer balls
- Twenty football shirts

If there are any questions concerning the new forms please contact the assistant treasurer. We look forward to your continued support.

Treasurer

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Exercise 4.4

This is a practical exercise. Any reasonable answer that meets the requirements of the task is acceptable.

Exercise 4.5

1 You should provide a printout of the folder showing the saved document. You should print the edited table and it should look like this:

Food	Energy
A portion of fish	363
A portion of potatoes	129
One boiled egg	380
A slice of bread and butter	180
One peanut	25
One carrot	85

2

Planet	Diameter (km)	Distance from sun (millions of km)	Length of year (Earth days)
Mercury	4 840	58	88
Venus	12 200	108	225
Earth	12 800	150	365
Mars	6 750	228	687
Jupiter	143 000	778	12
Saturn	121 000	1430	29
Uranus	47 200	2870	84
Neptune	44 600	4500	154
Pluto	6 000	5900	248

3

Name	Student number	Weight (kg)	Height (cm)
Adil Mir	302001	40.5	140.5
Mike Johnson	302002	45.2	160.3
Julie Maynard	302003	50.6	165.0
Brian Taylor	302004	48.8	150.2
Andrea Campbell	302005	65.0	166.3

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4

Zenith Oil Company

Sports and Cultural Club

CASH LISTING FOR THE PERIOD SEPTEMBER 01st 2010 – OCTOBER 31st 2010

Date	Description	Receipts	Payments	Cash balance on hand
	Bal b/fwd			0
Sept 02	Raffle (200 sheets @ $10.00 a sheet)	2000		2000
Sept 06	Breakfast Sale	600		2600
Sept 08	Prizes for raffle		500	2100
Sept 09	Cake Sale	550		550
Sept 15	Cost of prizes for cricket presentation		1200	2650
Sept 20	Cost of refreshments for cricket prize giving function		800	1450
Sept 28	Subscription Fees for September	500		650
	Bal c/fwd			1150

Date: November 05 2010

Treasurer

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Exercise 4.6

This header should be on each page of the document: 'Staff Agenda, Volume 1, Number 10'. The page number should be centred and in the footer.

Staff Agenda

STAFF DEPARTURES AND ARRIVALS

On behalf of the bank I wish to express our sincere appreciation to and extend best wishes to the following employees:

Mr. John Cardinal, Accounting Supervisor, Fyzabad Branch has resigned with effect from September 25, 2010. Mr. Cardinal served the bank for ten (10) years in the Accounting department.

Mrs. Leanna Achong, Clerk II, Head Office has resigned effective October 10, 2010. Mrs Achong served the bank for eight (8) years in various departments.

NEW STAFF

On behalf of the bank I would like to welcome the following employees to our institution:

Mr. Larry Phillips has been employed as a Programmer I in the M.I.S. department. Mr. Phillips started on October 6, 2010.

Mr. Glenn Singh has been employed as a Professional Trainee in the Accounting department. Mr. Singh started on October 6, 2010.

STAFF PROMOTIONS

On behalf of the bank I would like to congratulate Ms Teresa Black, Junior Accounting Supervisor, Fyzabad Branch. Ms Black has been promoted to Accounting Supervisor, effective September 26, 2010.

SPORTS NEWS

The Bank's annual Sports and Family Fun 2010 day will be held at the Centre of Excellence, Macoya, on January 14, 2011 at 9.00 am. All branches are asked to elect their team captains and start making preparations for this grand day. There will be events for the entire family. Music will be provided and each employee and their family will receive chits for lunch and refreshments. We look forward to seeing each and every one of you with your family.

FUNDRAISING EVENTS

The Scrabble club will be having a Christmas breakfast on December 14, 2010 to raise funds to purchase hampers for the needy. For further information please contact Ms Gloria Simmons, Personnel Department Head Office.

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TRAINING AND DEVELOPMENT

SEMINAR ON MONEY LAUNDERING

The Bank Inspection Department will be conducting a seminar for supervisors on January 17 to 20, 2011 at the Training Centre in Couva. This is the first in a series of seminars and workshops designed to empower our staff with the necessary skills to deal with the problem of money laundering.

Supervisors attending the seminar will conduct knowledge-sharing presentations within their Banks upon their return.

ADVANCED EXCEL WORKSHOP

There will be a three-day Advanced Excel workshop to be held on January 21 to 23, 2011 at the Training Centre in Couva. The workshop is designed for members of staff who have completed the Introductory Excel course. Notification will be sent to managers of respective branches, who would then make arrangements for individual employees to attend.

EXAMINATIONS

The Bank would like to congratulate the following employees on obtaining their Institute of Bankers Diploma:

Mr. Kevin Khan

Mr. Daniel Ramjohn

Ms Roanna Gill

A NOTE ON CUSTOMER SERVICE

With the increasing competition from our competitors we must seek to differentiate ourselves by standing out from the others. We believe this could be achieved by customer service. Customer service is the perception the public has of our institution. It is about delivering to our customers what we advertise, the personal touch that makes a customer feel special. Remember that poor customer service is an unpleasant experience and could lead to loss of business. Good customer service is a pleasant experience and leads to further business.

At this point in our bank's development, we would like all our employees to remember that good customer service is one of the main contributors to the growth of our organization.

STAFF CHRISTMAS DINNER

This year's annual Christmas dinner will be held at the Main Ball Room of the Mahogany Hotel. All employees are invited along with a guest. Cocktails will be from 7.30 to 8.30 pm and dinner will be from 8.30 pm. Music will be provided by a DJ and a live band. We look forward to seeing all employees.

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Exercise 4.7

1

Happy Valley High School
12 Valley Line Road
Ocho Rios

04-01-2011

Dear Mr Jaffar

You are requested to attend the school's annual parents' day with your son, Ronald, of 8MX on January 22nd, 2011.

We look forward to seeing you.

Yours truly,

C.Johnson
Headteacher

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2

Makhan Furniture Shop
Broad Street Bridgetown
Barbados

Ms Sherry Roach
8 Railroad Street
Blackrock

Dear Ms Roach

Please be informed that our accounts are showing that you have not paid your monthly installment of $875 towards your purchase on 15 08 2010. Kindly pay this amount to your account, number Aug150 to avoid any inconvenience.

Yours truly,

Lenore Brown
Manager

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Chapter 5

Exercise 5.1

1 **a)** Only you know the answer to this question!

b) In Microsoft Excel, the special character is '='. In other spreadsheets this special character may be different.

2 D – 5 rows and 4 columns

3 **a)** A cell is the intersection of a row and a column.

b) A cell reference uniquely identifies a cell using a combination of the column and row labels, for example, in Excel, cell reference C9 identifies the cell at the intersection of column C and row 9.

c) A range reference identifies a rectangular group of cells. For example, in Excel, B4:D6 identifies cells B4 to B6 and C4 to C6 and C4 to D6.

d) A formula is an expression that calculates a value using numbers in specific cells and standard functions, etc. For example, =sum(A4:A9)

e) A worksheet is a page of a spreadsheet.

4 A spreadsheet could be used in any situation where calculations are needed, for example:

- For keeping track of personal income and spending. A spreadsheet would be used because it's easy to edit; the layout encourages systematic working; formulae can be used and these recalculate when related cells are edited.
- To produce sales figures for a business. A spreadsheet is used because the latest data can be entered and a chart can easily be produced and it will be automatically updated if there are any changes.

5 You should have created the worksheet identical to that shown in Figure 5.3 and saved it with the file name 'Sales'.

Exercise 5.2

1

	A	B	C	D	E
1			Trinidad Wholesalers Ltd		
2					
3			January	February	March
4	Sales		50400	65875	60456
5	Expenditure		40356	40543	42348
6					

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Exercise 5.3

1 Your spreadsheet should now be similar to Figure 5.4 which shows the outcome of calculating the total sales for the three months and the profit for January.

2 In this instance, recalculation means that when the value in cell C5 is edited then the value in C6 changes automatically.

3 to **8**

	A	B	C	D	E	F
1			Trinidad Wholesalers Ltd			
2						
3			January	February	March	Total
4	Sales		50400	65875	60456	176731.00
5	Expenditure		39365	40543	42348	122256.00
6	Profit		11035.00	25332.00	18108.00	54475.00
7						

Exercise 5.4

1 to **10**

	A	B	C	D	E
1		Premium Furniture Store			
2					
3		First Quarter Sales			
4					
5		January	February	March	Total
6	North	20050	22442	23456	65948
7	South	45600	23246	67543	136389
8	East	78540	98755	65981	243276
9	West	53543	90453	43872	187868
10	Corporate	197733	234896	200852	633481
11					

6 The cell references are automatically recalculated are B10, E6, E10

Exercise 5.5

1 to **11** See Figure 5.8 Calculation of the final selling price.

Exercise 5.6

1 to **19**

	A	B	C	D	E	F	G	H	I
1		Premium Furniture Store							
2									
3		First Quarter Report							
4									
5		January	February	March	Total	Expenditure	Profit before Tax	Tax on Profit	Profit after Tax
6	North	£20,050.00	£22,442.00	£23,456.00	£65,948.00	£5,000.00	£60,948.00	£9,142.20	£51,805.80
7	South	£45,600.00	£23,246.00	£67,543.00	£136,389.00	£6,754.00	£129,635.00	£19,445.25	£110,189.75
8	East	£78,540.00	£98,755.00	£65,981.00	£243,276.00	£3,476.00	£239,800.00	£35,970.00	£203,830.00
9	West	£53,543.00	£90,453.00	£43,872.00	£187,868.00	£9,034.00	£178,834.00	£26,825.10	£152,008.90
10	Corporate	£197,733.00	£234,896.00	£200,852.00	£633,481.00	£24,264.00	£609,217.00	£91,382.55	£517,834.45
11									
12									
13	Average Profit		£129,458.61						
14									

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Exercise 5.7

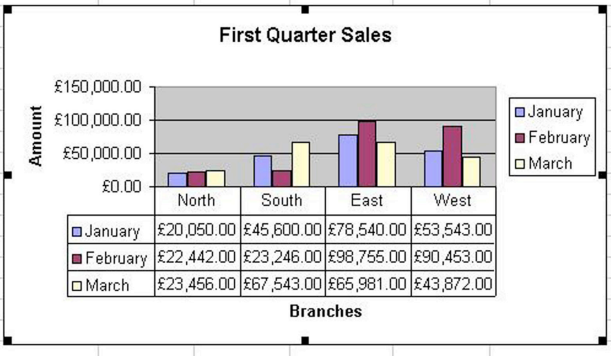
1 to **7**

	A	B	C	D	E	F
1		**The Small Book Store**				
2						
3	**Author**	**Title**	**Classification**	**No. of Copies**	**Unit Cost**	**Total Cost**
4	Brown James	Back to God Head	Religious	5	$50.00	250.00
5	Brown James	Faith Healers	Religious	10	$45.00	450.00
6	Jaira Kadine	Apocalypse	Thriller	3	$78.00	234.00
7	Jaira Kadine	Eagle and the Falcon	Thriller	3	$75.00	225.00
8	Lucas Gary	Bad Omens	Horror	6	$54.00	324.00
9	Lucas Gary	Dracula	Horror	4	$40.00	160.00
10	Lucas Gary	The Dark Side	Horror	7	$76.00	532.00
11	Mars Richard	Star Chase	Science Fiction	6	$39.00	234.00
12	Mohammed Afzal	In Touch with God	Religious	3	$80.00	240.00
13	Richards Jennifer	Outer Planet Experience	Science Fiction	5	$65.00	325.00
14						

Exercise 5.8

1 to **7**

	A	B	C	D	E	F	G	H	I
4									
5		January	February	March	Total	Expenditure	Profit before tax	Tax on profit	Profit after tax
6	North	£20,050.00	£22,442.00	£23,456.00	£65,948.00	£5,000.00	£60,948.00	£9,142.20	£51,805.80
7	South	£45,600.00	£23,246.00	£67,543.00	£136,389.00	£6,754.00	£129,635.00	£19,445.25	£110,189.75
8	East	£78,540.00	£98,755.00	£65,981.00	£243,276.00	£3,476.00	£239,800.00	£35,970.00	£203,830.00
9	West	£53,543.00	£90,453.00	£43,872.00	£187,868.00	£9,034.00	£178,834.00	£26,825.10	£152,008.90
10	Corporate	£197,733.00	£234,896.00	£200,852.00	£633,481.00	£24,264.00	£609,217.00	£91,382.55	£517,834.45
11									
12									
13	Maximum Profit		£203,830.00						
14	Minimum Profit		£51,805.80						
15	Average Profit		£129,458.61						
16									



Extension questions

- If D4 has the value 55, then 'stock levels adequate' is displayed in cell E4.
- If D4 has the value 23, then 'reorder' is displayed in cell E4.

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Exercise 5.9

	A	B	C	D	E	F	G
1			First Trinidad Bank				
2							
3	Customer Name	Starting Balance	Interest Rate	Interest Earned	Tax	Interest after tax	Final Balance
4	Larry Adams	$45,000.00	8%	$3,600.00	$0.00	$3,600.00	$48,600.00
5	Marie Balfour	$69,000.00	10%	$6,900.00	$1,035.00	$5,865.00	$74,865.00
6	James Chin-Fat	$84,000.00	10%	$8,400.00	$1,260.00	$7,140.00	$91,140.00
7	Harry Doonath	$35,000.00	8%	$2,800.00	$0.00	$2,800.00	$37,800.00
8	Krishna Harrylal	$50,000.00	8%	$4,000.00	$0.00	$4,000.00	$54,000.00
9							

Quick question

- Sheet2!E4
- Sheet1!B2
- Ingredients!B3:B11

Exercise 5.10

a) to **c)** See Figure 5.16.

d) to **i)** See Figure 5.20.

Spicy chicken and egg with noodles:

	A	B	C	D	E
1	**Dish: spicy chicken and egg with noodles**				
2					
3	chicken	£ 4.45			
4	egg	£ 1.20			
5	noodles	£ 1.75			
6					
7	Cost of dish	£ 7.40			
8					
9					
10					
11					

Exercise 5.11

7 You should have used RedCell to emphasise the items of expenditure which Jean might be able to reduce. These items are entirely Jean's personal choice; however, it is likely that she would have emphasised Food and Entertainment as spending on these is a very large proportion of her income.

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Exercise 5.12

1 a)

- If there are 20 customers and 5 checkouts open, the last customer will have to wait 18 minutes.
- If the number of checkouts open is reduced to 4 then customers will have to wait over 10 minutes. As a result, all 5 checkouts will need to be open.

b) The supermarket should estimate the maximum number of customers who are likely to be queuing and an acceptable waiting time. This enables the maximum number of checkouts required to be calculated. However, it may be more economical to have fewer checkouts or the number of checkouts may be restricted by the design of the building. In this case, the supermarket can use the model to identify how long customers will have to wait when they are busy and plan ways to reduce queues or facilities to keep customers amused while waiting, for example with food tasting.

Exercise 5.13

1 a) to **g)**

	A	B	C	D	E	F	G	H
1	**Student's weekly allowance**							
2								
3		**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**		**Item totals**
4	Travelling	$4	$4	$4	$4	$4		$20
5	Lunch	$2	$3	$2	$4	$6		$17
6	Snacks	$3	$2	$1	$2	$2		$10
7	Games World	$10	$9	$5	$6	$10		$40
8								**Weekly total**
9	Daily total	$19	$18	$12	$16	$22		$87
10								**Allowance**
11								$50
12								**Amount left**
13								-$37
14								

h) Games World and travelling are the larger items of expenditure. The student should spend less at Games World and travel less frequently or reduce expenditure on travelling by walking, for example.

2 a) to **e)**

	A	B	C	D	E	F	G	H
1								
2								
3	**Employee**	**Category**	**Hours worked**					
4			**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Total hours**	**Total salary**
5	Agard, Jason	skilled	45	56	45	40	186	$5,580.00
6	Bobart, Richard	unskilled	65	45	45	57	212	$4,240.00
7	Brown, Sarah	skilled	56	45	50	68	219	$6,570.00
8	Maraj, Rudy	unskilled	40	55	43	55	193	$3,860.00
9	Parker, Anne	unskilled	56	45	76	45	222	$4,440.00
10	Patel, Rani	unskilled	35	40	67	40	182	$3,640.00
11								
12	**Wage rates**			**Average salary**		$4,721.67		
13	Unskilled	$20.00		**Maximum salary**		$6,570.00		
14	Skilled	$30.00		**Minimum salary**		$3,640.00		
15								

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f) to **i)**

	A	B	C	D	E	F	G	H
1								
2								
3	**Employee**	**Category**			**Hours worked**			
4			**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Total hours**	**Total salary**
5	Agard, Jason	skilled	45	56	45	40	186	$7,440.00
6	Brown, Sarah	skilled	56	45	50	68	219	$8,760.00
7	Maraj, Rudy	unskilled	40	55	43	55	193	$4,825.00
8	Parker, Anne	unskilled	56	45	76	45	222	$5,550.00
9	Patel, Rani	unskilled	35	40	67	40	182	$4,550.00
10	Taylor, Wesley	unskilled	50	60	45	40	195	$4,875.00
11								
12	**Wage rates**			**Average salary**		$6,225.00		
13	Unskilled	$25.00		**Maximum salary**		$8,760.00		
14	Skilled	$40.00		**Minimum salary**		$4,550.00		
15				**Total salary for all**		$36,000.00		
16								

j) This question is easier if you begin setting up the spreadsheet by putting the rates of pay in identifiable cells and use absolute cell references rather than building the rates of pay into formula. The owner could offer the unskilled workers a $5 per hour increase if the skilled workers are offered no increase. Alternatively, the rate for skilled workers could be increased by $9 if the unskilled workers rate of pay is unchanged. It is possible to offer each group of workers an increase but how this is distributed could depend on factors other than affordability, such as, ability to recruit and the effect on productivity and profits. For example, unskilled workers might be offered an increase of $3 and skilled workers and increase of $4.

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Chapter 6

Exercise 6.1

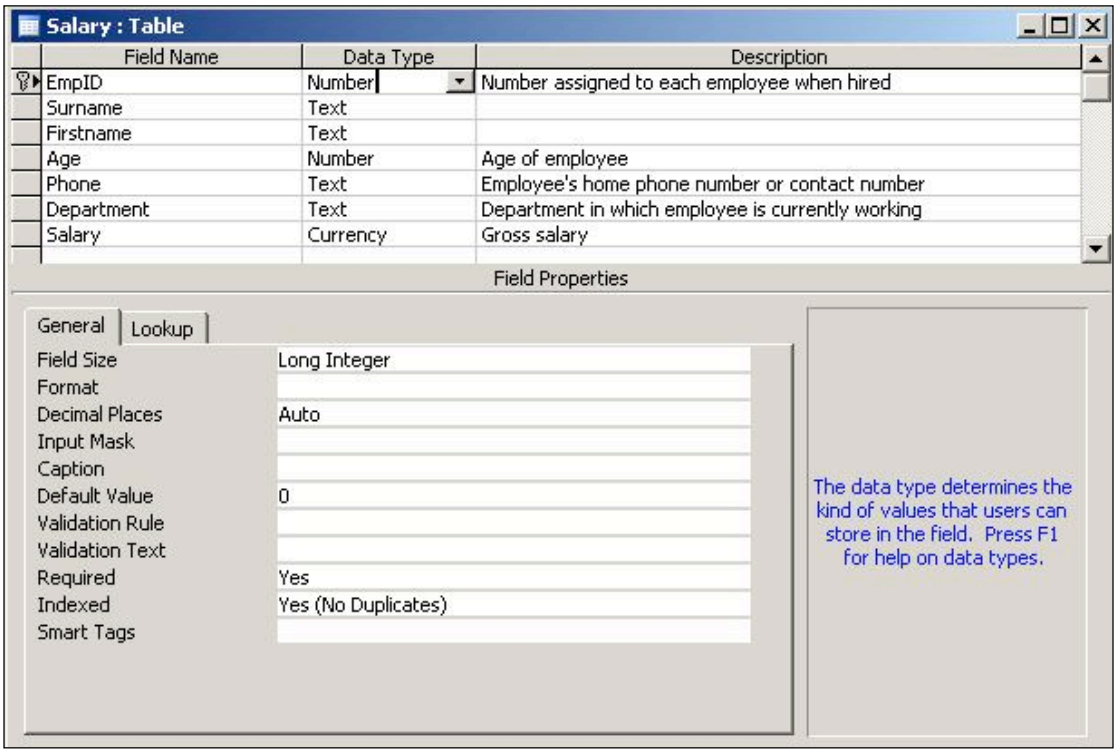
1 Only you know this! For example, Microsoft Access.

2 A – A primary key has a value that can only occur once in a column

3 Please refer to the Glossary.

4 The answer is given in Figure 6.8 Structure of the Stock table.

5



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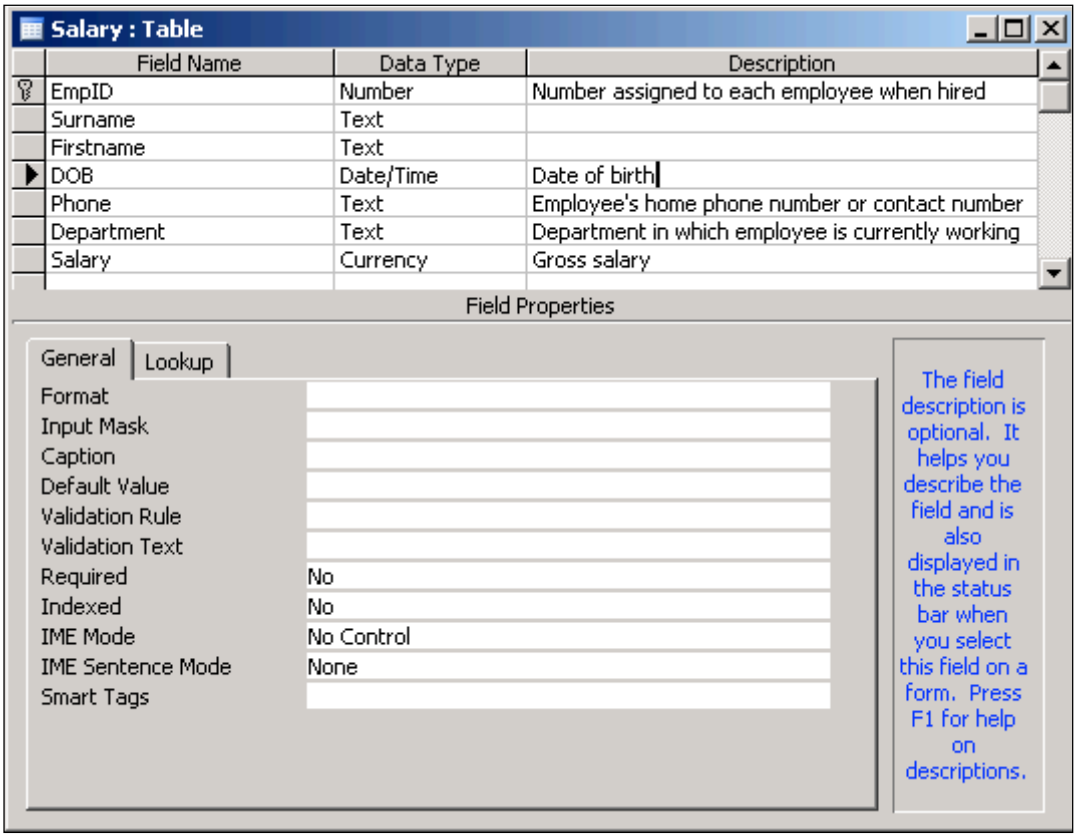
Exercise 6.2

1 Figure 6.9 shows the field properties for the Quantity field, including the validation rule.

2 **c)** It is better to use the date of birth because this is likely to be accurate for the lifetime of the individual whereas age is only accurate for one year at most.



Exercise 6.3

1 Figure 6.11 shows the completed Stock table.

2

EmpID	Surname	Firstname	DOB	Phone	Job	Salary
143	Alexander	Anthony	02/03/1983	622-5667	Janitor	3,000.00
125	Baptiste	Lisa	11/08/1976	634-5478	Clerk	3,500.00
131	Griffith	Viola	25/10/1973	697-2532	Engineer	9,500.00
245	Moore	Gillian	15/10/1965	615-1234	Clerk	4,000.00
25	Moore	Ian	04/11/1978	677-5865	Janitor	2,500.00
56	Moore	Sean	15/10/1962	648-2343	Accountant	8,000.00
63	Neptune	Kent	23/09/1968	658-4533	Programmer	6,000.00
187	Ramrattan	Nalini	21/04/1972	687-3213	Secretary	3,800.00
81	Sakawat	Amit	14/03/1975	678-9651	Systems Analyst	9,000.00
46	St. Louis	Allan	17/07/1980	634-7806	Engineer	8,000.00
10	Viera	Edison	19/03/1979	648-5432	Manager	12,000.00

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Exercise 6.4

5 **a)** Figure 6.16 shows all the products with brand name 'Superior Brand'.

b) Figure 6.17 shows all the items whose quantity is less than or equal to 20.

c) Figure 6.18 shows all brands and their suppliers in ascending order.

6 Figure 6.19 shows the Design View and results for all the order numbers, item numbers and quantity ordered from the period 5/04/00 to 05/25/00.

7 **a)** See Figure 6.20.

b) See Figure 6.21.

8 The results are shown in Figure 6.22.

9 The results are shown in Figure 6.23.

Exercise 6.5

1 The report will be displayed as shown in Figure 6.30.

8

name and DOB female students : Select Query

Surname	Firstname	DOB	Sex
Lara	Leanna	23/03/1991	F
King	Mary	12/12/1990	F

9

Query1 : Select Query

Surname	Firstname	DOB
King	Mary	12/12/1990
Singh	Vishnu	28/09/1990

10

students sorted by surname then firstname : Select Query

StudID	Surname	Firstname	DOB	Address	Hphone	Religion	Sex
10056	Ali	Fyzool	15/10/1991	Gonzales	6483216	M	M
10048	Barnes	David	06/08/1991	Siparia	6492546	C	M
10105	King	Mary	12/12/1990	Fyzabad	6779784	C	F
10123	Lara	Leanna	23/03/1991	Phillipine	6525335	C	F
10065	Singh	Vishnu	28/09/1990	Debe	6474226	H	M
0							

11

students scoring more than 70 in Maths : Select Query

StudID	Surname	Firstname	Maths
10123	Lara	Leanna	80
10105	King	Mary	75

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12

The total marks received by each student : Select Query

StudID	Surname	Firstname	Maths	Phys	Chem	Bio	Eng	Comp	Total
10048	Barnes	David	25	40	55	45	65	60	290
10056	Ali	Fyzool	70	85	80	65	75	65	440
10065	Singh	Vishnu	60	65	75	65	88	55	408
10105	King	Mary	75	65	76	65	80	72	433
10123	Lara	Leanna	80	70	60	41	75	86	412

13

The total marks received by each student : Select Query

StudID	Surname	Firstname	Total	Farthersurname	Fatherfirstname	Fartheroccup
10056	Ali	Fyzool	440	Ali	Karim	Teacher
10048	Barnes	David	290	Barnes	Anthony	Engineer
10105	King	Mary	433	Walcott	Jason	Accountant
10123	Lara	Leanna	412	Lara	Mathew	Taxi Driver
10065	Singh	Vishnu	408	Singh	Krishna	Supervisor

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Chapter 7

Exercise 7.1

1 Only you know the answer to this!

5 **a)** Bit mapped graphics have a fixed number of pixels. If the image is smaller the pixels are denser and the image looks sharper; if the image is larger the pixels are spread out and the image quality can be fuzzy.

b) Vector graphics are constructed by the graphics software and are of a consistent quality. For example, a straight line will be stored as the coordinates of the start and end points. The straight line between these is constructed by the graphics software.

c) A vector graphic will always have the same file size. In the example in b), the coordinates of the ends of the points are stored and these will be the same whatever the size of the image. A large bit mapped file will be bigger than a small bit mapped file if image quality is the same because it will have more pixels.

Exercise 7.2

1 Only you know the answer to this!

2 D – Formula

Exercise 7.3

1 Only you know the answer to this!

2 C – Insert table

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Chapter 8

Exercise 8.1

This is a practical exercise. Any reasonable answer that meets the requirements of the task is acceptable.

Exercise 8.2

1 c) Reasonable answers to these questions could be:

- Why: in order to find information or goods on the web.
- What search engines do: they search their indexes to find what you are looking for.
- How: you enter keywords that will help the search engine find what you are looking for.

2 c) Reasonable answers to these questions could be:

- The Yorkshire Dales region is located to the north west of Skipton and to the east of the M6.
- Tourists holiday in the Yorkshire Dales if they are interested in: the countryside, horse riding, falconry, climbing, pot holing, walking and other outdoor pursuits.
- You should list the name and website address of places to stay. For example:

Self catering accommodation	
Hazel Cottage	www.maltkiln.com
Howgill Lodge	www.howgill-lodge.co.uk/
2 Hollies Cottages	www.stainforth-holiday-cottage-settle.co.uk/

- You could add columns to the table showing the maximum and minimum rental price.

3 a) You should list activities available at a sports centre, for example: football, squash, badminton, aerobic exercise and swimming. The name of each activity could be a hyperlink to the slide that has information about it.

b) Each slide should be illustrated and have the relevant information. Research this at a local sports centre, for example:

- Football – five-a-side
- Suitable for different age groups, such as 16 to 19 years old.
- List the times the activity takes place, such as 4.00pm to 7.00pm.
- Find out the cost at a local sports centre.
- Insert a link back to the menu slide.

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Chapter 9

Exercise 9.1

1 D – Viruses can be sent to many users

2 **a)** A LAN consists of a collection of computers that can share peripherals and Information, and communicate with each other over a network. These are likely to be in the same room, building, department, school or workplace.

b) A WAN can connect networks across a large geographical area, such as a city or a country or even internationally. Information can be transmitted in many ways; for example, using high-speed telephone lines, fibre optic cables, microwave links and satellite links, or a combination of these.

3 **a)** and **b)** You might have described a LAN in a computer room at your school or college. When you draw a map of the LAN, this will probably show a direct connection from each computer to a hub or server. If you do this for a computer room, you may also find it interesting to draw a scale diagram of this and draw the actual location of the network on it.

c) A LAN's ability to share information and communicate with devices and computers on the LAN has many advantages:

- Software and data files can be shared by many users.
- Users can work together on a single shared document.
- Users can communicate by using instant messaging or email, for example.
- Users can stream media, so that they can view video and play audio on any computer or other device attached to the network.
- It is usually cheaper to buy one copy of a software application and pay the licence fee for several computers, than to buy individual licences for each computer.
- Users can share hardware devices. For example, an expensive, very good quality, high speed, A3 printer could be shared by network users at a lower cost per user than if each user had to be provided with a local printer that would be likely to be cheap, poor quality, slow and print on A4 paper.
- Users can share an Internet connection. A faster, higher bandwidth broadband Internet connection could be purchased for a LAN, and this could allow every user to be connected at the same time. If each user was connected individually, then the Internet connections would be more expensive and slower.
- Users' access rights can be controlled centrally. For example, a user can be given a username and password that will work on any connected computer. When the user logs on to the network, they may see their own customised screen and be given access to some resources but blocked from accessing other files.
- Computers attached to the network can be maintained either centrally or from any network station. For example, if some software has become corrupted on a network station, the network technician can log on at any other network station, and remove and reinstall the software. Similarly, users' passwords can be reset and the printer queue can be maintained.

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There are disadvantages too:

- The initial set-up costs are higher than for the same number of individual computers because a server and network cabling have to be installed. However, this has to be set against the need to buy printers and scanners for the individual computers whereas fewer would be needed for a LAN.
- There is an increased risk of data corruption. Since many users will be using the system, there is a greater chance of data being corrupted or tampered with.
- There is a greater risk from viruses, because they are easily spread between the computers that are part of the LAN. If the server breaks down then the entire network will not function.

4 **a)** Three essential components of a WLAN are wireless access points attached to the network, wireless NICs and a router.

b) Any reasonable reason, for example:

- Access is more flexible. Users can access a WLAN from wherever they are working provided their computer is within range of the network and has a wireless NIC.
- If the user is moving around within range of the network, access can be maintained.
- A WLAN may be easier and cheaper to install as fewer cables are required. Electrical and network cables are usually embedded within the structure of the building and special provision has to be made for this.

5 **a)** Please see the Glossary.

b) Any reasonable answer is acceptable as these may vary depending on the country you are working in and the type of broadband you have. For example, in the UK, if you have broadband through a telephone line:

- Advantages of dial-up Internet access: You only pay for what you use and you use a normal telephone line.
- Disadvantages of dial-up Internet access: Slow web access. The telephone line cannot be used by someone else during Internet access for either telephone calls or Internet access for an additional computer.
- Advantages of broadband: Much faster web access. The normal telephone line is available in addition to VoIP over your broadband connection.
- Disadvantages of broadband: You pay a monthly subscription for connection. A high speed broadband connection is not available everywhere in the UK.

Exercise 9.2

1 A – Modem

2 **a)** Please see the Glossary.

b) An ISP is a company that is directly connected to the Internet and will give you access to it, usually for a fee. You need a subscription to an ISP so that you can access the Internet.

3 The terms narrowband and broadband are used to describe the capacity of transmission channels, but these terms are not exact. Narrowband is used to refer to data transmission over a telephone line using an analogue modem that can transmit data at speeds up to 56 Kbps (or 56 Kbaud). Broadband has much faster transmissions speeds.

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4 **a)** Please see the Glossary.

b) The advantages and disadvantages of email compared with the post. Any reasonable answer, for example:

- Email usually arrives faster than a letter sent in the post. This is especially true for long distances; for example, you would expect an email to Australia from the UK to be very fast but a parcel might take several days.
- You need a computer and Internet access to send email. These are expensive to buy and you need to know how to use them.
- You can send more documents by email and the cost is the same whereas with the mail, the more you send the more it costs.
- You can send a wider variety of contents by mail. For example, you could send clothing, whereas with email you can only send documents or other similar attachments.
- If you already have a computer and Internet access then email is almost cost free, whereas with a letter you have to pay each time you send one and the cost relates to the size of the letter or parcel.

c) Any reasonable answer, for example:

- With email, it doesn't matter if the person you are trying to contact isn't there. You can send an email at any time and this is saved until the recipient accesses their email. To speak to someone on the telephone, they must be there (or you can leave voicemail which is effectively spoken email).
- You need a computer and Internet access to send email. These are expensive to buy and you need to know how to use them. A telephone is relatively cheap to buy and easy to use.
- You can send documents by email whereas with the telephone you cannot send documents.
- If you already have a computer and Internet access then email is almost cost free, whereas with a telephone call you have to pay each time you make a call and the cost relates to the distance covered.
- With a telephone call you can have a conversation but with email most communication has to be entered into a computer.

  You can send a wider variety of contents by email whereas with a telephone call you can only speak.

d) If you forwarded the email no email addresses would be automatically entered in any fields but the attachments would be retained.

e) Email contacts are an electronic address book containing names, email and postal addresses, telephone numbers, etc. for friends and colleagues. Contacts can be used to quickly find the email address of the person you are sending the email to.

5 Any reasonable answer, for example:

- A mailing list is a group of people using email to communicate their views on common issues or interests. When a member sends a new message to the list then all the members of the list will receive this message in their in box.
- A newsgroup is a group of people with common interests who communicate by posting messages and replies on the Internet. Members have to remember to look for new messages and may forget or not realise a new message has been posted.

6 Please see the Glossary.

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7 Chat is direct communication with a group of people by sending messages which are delivered immediately to everyone in the chat room. You might want to use it for socializing with a group of friends or organizing a job with a work group.

8 **a)** Please see the Glossary.

b) For example:

- www.google.co.uk
- www.ask.com
- www.excite.co.uk

c) Any reasonable answer, for example: Search engines have indexes of the web addresses of information pages and brief descriptions of what is on the page and these are associated with key words. When key words are entered in the search engine, the web addresses and descriptions are retrieved from the index.

9 **a)** Any reasonable, for example: Google Chrome, Internet Explorer, Firefox, etc.

b) Any reasonable, for example: A browser enables a user to access and view web pages.

c) Any reasonable, for example:

- Bookmarks or Favorites. Used for storing the web addresses of pages that you want to access again.
- Home button to return to the home page.
- Tool bar with buttons. The buttons on the tool bar can be selected by the user.
- Go backward button, to return to the previous page.
- Refresh button to force the browser to access the web page.
- A cache to store frequently accessed web pages.
- Accessibility features, such as enlarging text.

10 Online shopping is shopping using the web. You find what you want to buy, pay for it by credit or debit card and it is delivered to your home by post or delivery van.

Any reasonable advantage, for example:

- A much wider range of goods is available.
- You may be able to specify what you are buying before it is manufactured.
- You don't waste time going round the shops only to discover none have what you want.
- Prices may be cheaper.
- You can read the comments of others who have bought the goods.

Any reasonable disadvantage, for example

- You have to wait for goods to be delivered. This may take several days.
- You cannot see the goods beforehand. They may not be of the quality you expect.
- The goods may not arrive.
- Hackers may copy your credit or debit card and use it to defraud you.

11 Online banking is banking using the web. You can look at your bank statements, pay money to other on line accounts and receive payments.

Any reasonable advantage, for example:

- You can access all your bank details without going to a branch of the bank.
- You access your bank account over the web so it can be more private.
- It is easier to invest in a wider range of bank and savings accounts.

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- You can set up payments to others in advance so you don't forget to pay.
- You never have to travel to a branch of the bank (if there are any).

Any reasonable disadvantage, for example:

- You have to use a cashpoint to withdraw cash.
- Cheques can only be paid in by post or at a branch of the bank.
- If you need advice from your bank you can only get this by telephone or email.
- You have to have a computer with Internet access.

12 Please see the Glossary.

13 Please see the Glossary. You may find real examples in your email inbox.

14
- **http** is the type of resource and this is a web page.
- **www.pearson.com** is the domain name of the host computer and this is an international commercial organisation.
- **community** is a directory or folder on the host computer.
- **index** is a filename.
- **.htm** is an extension and this shows that the file contains HTML (Hyper Text Mark-up Language).

15 **a)** Any reasonable answer, for example:

- Provision of information about its products for customers.
- Improved marketing of the company's products.
- Direct sales to customers via the website.

b) An intranet is a network similar to the Internet but only available to those working for a particular organisation or company.

c) Any reasonable benefit in setting up an intranet, for example:

- An intranet can be used as an information service to help employees follow the company's policies and practices.
- Employees can operate the company and resolve any difficulties without constant public exposure.

Exercise 9.3

1 **a)** i) Any reasonable answer, for example:

- Post: the minimum is to write the note on a piece of paper, put it in a stamped addressed envelope and post it in the nearest post box.
- Email: type it into your computer or smart phone and send it.

ii) Any reasonable answer, for example: Email is likely to be faster than post. However, it may be quicker to write the message on a piece of paper and deliver it by hand.

iii) Remember to take into account the total cost when assessing which method is cheaper. For example, each email is free to send but you have to buy all the equipment and subscribe to an ISP for an Internet connection.Any reasonable answer, for example: It may be cheaper to write the message and deliver it by hand. Otherwise the post is likely to be cheaper as set up costs are relatively low and there is no fee or subscription to pay.

iv) Any reasonable answer, for example: Email could be more convenient, if you're logged on accessing your email is almost instantaneous.

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v) Any reasonable answer, for example: Personal delivery is probably the most secure because the message does not leave the sender until it is delivered.

b) Any reasonable answer, for example:

- Email is faster as it can be sent and received almost instantaneously.
- The post is likely to be cheaper as set up costs are relatively low and there is no fee or subscription to pay each month to an ISP. However, you have to pay for the stamp on the envelope.
- Email is likely to be more convenient as you do not have to print the leaflet, put it in an envelope and take the envelope to the post office.
- Email is likely to be more secure if it is encrypted. Otherwise security is comparable.

c) Any reasonable answer, for example: You would probably use email as it would arrive faster; it costs less than sending a large parcel in the post (ignoring set up costs and particularly if you were repeatedly doing similar activities); it's more convenient because you can do this from your office desk rather than having to go to the post office; email is likely to be more secure if it is encrypted.

d) Any reasonable answer, for example:

i) Answer same as for **b)** above.

ii) Answer same as for **c)** above.

iii) Answer same as for **c)** above as you can assume that all relevant technologies are available.

iv) Answer same as for **c)** above. The answer depends on the technologies available in the developing country.

2 **a)** How each of telephone, chat and video conferencing allow you to communicate instantly with another person. Any reasonable answer, for example:

- Telephone – you enter someone's number into a telephone, it rings. If they answer, you can talk to them in real time, otherwise you can leave a message on voicemail.
- Chat – you log on to a chat room and can send short messages to any other members of the chat room who are also currently logged on.
- Video conferencing – you can make contact with someone by dialling their number via Skype, for example. Using video conferencing you can see the person speaking to you.

b) Any reasonable answer, for example in the UK:

- Telephone – you have to pay for installation, monthly line rental and each call made unless it falls within the free call time of your contract.
- Chat – you have to pay for a computer and Internet access.
- Video conferencing – there are several popular methods. Using Skype, you have to pay for a computer, webcam and Internet access. Skype is free to download. Skype to Skype video calls are free.

c) Any reasonable answer, for example: Video conferencing is the most personal as you can have a spoken conversation and you can also see the person you are speaking to.

d) Any reasonable answer, for example: Chat may be less distracting as it is effectively email in real time. You are alerted when your friend has something to say but you do not have to respond immediately.

e) Any reasonable answer, for example: You may prefer chat for the reasons given in d) above. You may want to avoid video conferencing as you may want to keep your home life private and

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dress codes at work and at home are often different.

f) Any reasonable answer, for example: You are likely to prefer video conferencing so that everyone can be involved, they can question the expert directly, listen to the responses of the expert and ask further questions. If the expert is only available for a short time, this will maximise the project team's contact.

g) Any reasonable answer, for example: Pupils will probably want to see and talk to each other, and as it one class talking to another, a video conference with a large screen projector could be most effective. If the classes are to cooperate to complete a project together, and will need group discussion over a prolonged period between groups and individuals within each class, then it is worth consider using chat.

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Chapter 10

Exercise 10.1

This is a practical exercise with example output in the Student Book.

Exercise 10.2

1 This is a practical exercise. Any reasonable answers that meet the requirements of the tasks are acceptable.

2 **d)**

	A	B	C	D	E	F	G
1							
2							
3			The Blue Skies Holiday Company				
4			Year	Income	Expenditure	Profit	
5			2000	£600,500.00	£ 500,200.00	£ 100,300.00	
6			2001	£700,300.00	£ 600,100.00	£ 100,200.00	
7			2002	£800,600.00	£ 550,000.00	£ 250,600.00	
8			2003	£600,900.00	£ 200,000.00	£ 400,900.00	
9			2004	£500,300.00	£ 100,950.00	£ 399,350.00	
10			2005	£600,200.00	£ 100,900.00	£ 499,300.00	
11							
12							
13							
14							
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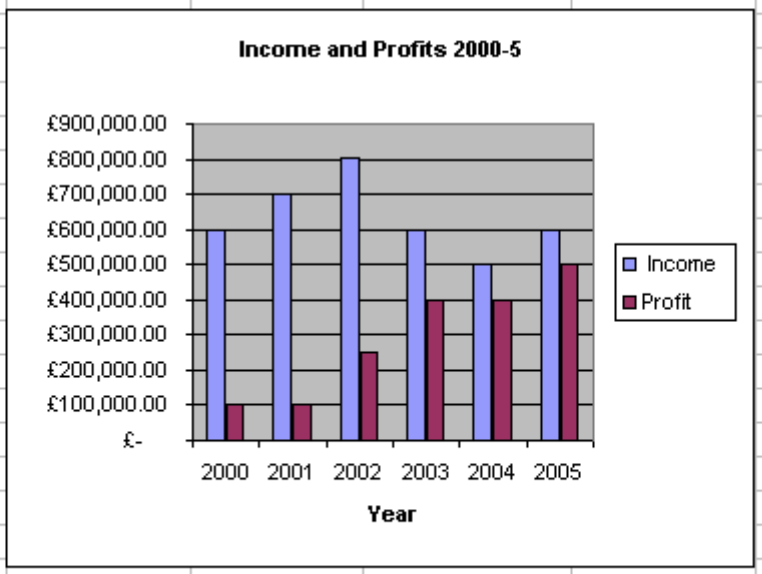

e) Any reasonable answer, but answers are likely to refer to:

- Income was on a downward trend, although there was a slight upturn in the final year.
- Profits were on an upward trend, although they did not always increase from one year to the next.
- Increased profits while income falls may indicate increasing efficiency in a declining market.

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Chapter 11

Quick question

ISBN 0-781-37388-8 This is not a correct ISBN number

ISBN 0-582-47388-8 This is a correct ISBN number

ISBN 0-582-47388-X This is not a correct ISBN

Quick question

In the UK 4th May 2006

In the USA 5th April 2006

It is correct in the USA but not in the UK

Exercise 11.1

1 A – Tick list

2 **a)** Any reasonable answer, for example:

Surname Name

First Name

Address line 1
Address line 2
Town

Post Code

Telephone No.

b) Any reasonable answer, for example:

Relationship of student to emergency contact. Please enter the code in box:

Code	Relationship
M	Mother
F	Father
GM	Grandmother
GF	Grandfather
O	Other
Other, please state:	

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3 a) Any reasonable answer, for example: Data written on a questionnaire is typed into a computer using a keyboard and saved on a hard disk.

b) Any reasonable answer, for example: Members of a sports club fill in a form giving their name and contact details. This is typed into a computer by a receptionist and saved on the club membership database.

c) Any reasonable answer, for example: The cost of labour for key-to-disk is more expensive than direct data entry methods, for example, scanning using OCR software.

4 a) Example and justification: If you want to join a sports club and you fill in a form and give it in at reception, then visual verification will be used because there isn't much to type in and if the receptionist makes a mistake, it can be corrected later.

b) Example and justification: In a catalogue company, many customers' orders are received by post and these are written on a standard form so double entry verification should be used. This is necessary because there are a large number of orders to type in and this must be done quickly and accurately.

c) Any reasonable answer, for example:

Advantages:
- Data is checked as it is entered and is immediately available.
- Less expensive than double entry verification.

Disadvantages:
- Error prone as people often miss mistakes.

d) Any reasonable answer, for example:

Advantages:
- Very accurate method of data entry.

Disadvantages of double entry verification:
- Very expensive as data is typed in twice and then corrected.

5 a) Any reasonable answer, for example: These are methods of direct data entry. If the equipment is working as it should then accurate entry is automatic.

b) Advantages:
- The organisation saves money as it does not need to employ data entry personnel.

Disadvantages:
- Some people will be put off filling in the questionnaire as it is necessary to have web access.

6 a) Your design might include:
- A title and an explanation of the purpose of the form.
- Request that the applicant give their surname, first name, address (4 lines), post code, contact telephone numbers (home, work, mobile), date of birth, gender, membership class and sign and date the form.

Your design should use data entry methods that help applicants to give information clearly and unambiguously, for example:
- Character boxes, so that applicants write one character in each box.
- Tick boxes, where there are a limited number of options so that applicants have to choose one of them. For example, gender could be male or female.

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- Code the data. For example, membership class could be coded as: O = ordinary; Y = young person; R = reduced rate etc.

b) A suitable verification method would be visual verification. Please see the Glossary for a definition.

c) Any reasonable answer, for example: It is not appropriate as there are not many forms to be input which does not justify the expense of printing OMR forms and buying an OMR reader.

d) Any reasonable answer. For example, if the date is input in DDMMYY form:

0<DD<32 for months with 31 days

0<MM<13

YY<00

7 See the answer to **6 a)** above.

8 **a)** See the answer to **7**. The data collection form, a questionnaire, would also need to include questions about lifestyle, for example:

How many hours do you watch television each week? (Please tick one box)

- ❍ I don't watch television at all
- ❍ 7 or more
- ❍ 14 or more
- ❍ 21 or more
- ❍ 28 or more

b) Any reasonable answer, for example: The form is to be made available in printed form and via a website. If it was only to be available on a website, I would have used drop down menus, however, as I wanted the form to look the same whether printed or on the website, I chose tick boxes. I used circular tick boxes like radio buttons so that the form would look the same on paper and on screen.

c) Any reasonable answer, for example: Data on the printed form will be typed in as I don't expect there will be very large numbers of these. The web form will be filled in by those responding to the research survey.

d) Any reasonable answer, for example:

- Visual verification would be appropriate. When the low volume of data on the printed forms is entered it will be visually checked by the data entry operator. The data entered into the web form will be verified by the young people who enter their data.
- Validation checks depend on the field being entered but could include checks similar to the following: a length check, to make sure the first name is less than 15 characters long; checks on the date of birth as in the answers to 7.

9 Any reasonable answer, for example: A validation check could not detect the following errors:

- The user enters 030409 thinking it is a DDMMYY date (3rd April 2009). If the computer was expecting a MMDDYY format date to be entered, the computer would interpret 030409 as 4th March 2009.

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- If your telephone number was +44 1274 888802 but you entered +44 1274 887702 by mistake.
- If your first name was John but you entered Jon.

10 1-902505-51-4 Answer: this is a correct ISBN number

1-85828-442-3 Answer: this is not a correct ISBN number
0-415-10735-0 Answer: this is a correct ISBN number
0-582-30494-5 Answer: this is not a correct ISBN number
0-582-05187-X Answer: this is not a correct ISBN number

Exercise 11.2

1 This is a practical exercise. Any reasonable answer that meets the requirements of the task is acceptable.

a) to **c)**

	1 2 3 4 5 6 7 8 9 10	11 12 13 14 15 16 17 18 19 20	21 22 23 24 25 26 27 28 29 30	31 32 33 34 35 36 37 38 39 40	41 42 43 44 45 46 47 48 49 50	51 52 53 54 55 56 57 58 59 60	61 62 63 64 65 66 67 68 69 70	71 72 73 74 75 76 77 78 79 80
1	NEWS AGENT	XXXXXXXXXX	XXXXXXXX	DATE XX/XX/XXXX	TIME XX.XX	HRS		
2								
3	CUSTOMER NAME		ADDRESS				AMOUNT OWED	
4								
5	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	£XXX.XX		
6	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	£XXX.XX		
7	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	£XXX.XX		
8	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	£XXX.XX		
9	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	£XXX.XX		
10								
11	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	£XXX.XX		
12	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	£XXX.XX		
13	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	£XXX.XX		
14	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	£XXX.XX		
15	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	£XXX.XX		
16								
17								

d) Any reasonable answer, for example: The table would be sorted into alphabetic order on customers' surnames.

e) Any reasonable answer and these will vary from place to place, for example:
M = Daily Mail; S = The Standard; T = The Times; G = The Guardian

2 **a)** Any reasonable answer, for example: M = Mathematics; E = English; I = ICT; H = History; A = Art. You need to be sure that each letter of the alphabet is associated with only one subject.

b) Any reasonable answer, for example: Gender could be coded M = male; F = female.

c) Any reasonable answer, for example: The sheet would have in the heading: the name of the school, the form teacher, the date, the class and the title of the report 'Assessment Information'. As it is only the assessment information that is required, this printout is likely to include only the name, gender and a grade for each subject for each pupil and this could be printed on one line.

d) Any reasonable answer, for example: The screen spacing chart would include only the information for one pupil but it would include all the information. The layout should be neat and tidy.

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3 Any reasonable answer, for example: Many search engines use this format, for example, see Google.

4 **a)** to **e)** Any reasonable answer, for example: A simple stylized picture that illustrates the topic. For example, a stylized picture of a sheep for **b)**.

5 **a)** Any reasonable answer, for example: The most appropriate way to illustrate this is using a pie diagram. The pie would have slices for swimming, weight lifting, aerobics, sauna and jacuzzi. To emphasise that aerobic exercise is the most popular activity, the aerobic slice could be slightly removed from the rest of the pie.

b) Any reasonable answer, for example: The most appropriate way to illustrate this is using a pie diagram. The pie would have slices for swimming, weight lifting, aerobics, sauna and jacuzzi. To emphasise that weight lifting is the least popular activity, the weight lifting slice could be slightly removed from the rest of the pie.

c) Any reasonable answer, for example: A line graph shows trends over time.

d) Any reasonable answer, for example: Sw = swimming; We = weight lifting; Ae = aerobic exercise; Sa = sauna; Ja = jacuzzi. Note that if a one character code was used swimming and sauna could have the same code. To keep the code meaningful and consistent, the first two letters are used.

6 Any reasonable answer, for example: Information for customers would be designed to both provide the information and persuade them to purchase the goods and services sold by the organisation. It would be eye catching and direct customers to adverts. The information could be structured to provide a positive view of the organisation. Information for employees would be designed to provide the information in ways that supports them in their work for the organisation. Other considerations would be much less important.

7 Any reasonable answer, for example: During the season, a football team usually plays at least once each week. Fans are interested in the progress of their team and often want to know the result and the position in the league table after each match.

8 **a)** Any reasonable answer, for example: The forecast would probably not arrive before you leave for the airport.

b) Any reasonable answer, for example: There are websites that will give you a weather forecast for most places in the world if you type in the place name. This would be available immediately and you could print it and take it with you.

9 Any reasonable answer for the following. For example:

a) PDAs and smart phones usually have small screens and slow download speeds compared with a desktop PC. As a result, large images would not be avoided.

b) Only sound can be output from speakers so output is restricted to meaningful forms of sound, for example: speech, music and warning sounds.

c) A data projector is used to display the output from a computer's screen on a larger display screen. Only visual images can be displayed unless it is also used with speakers.

d) A plotter usually draws lines on very large sheets of paper, probably A1 size. It cannot print detailed images or photographs.

e) The output from an electric motor is usually limited to a rotating drive shaft and this is used to power a range of actuators.

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10 **a)** Any reasonable answer, for example: Easy adjustment of the colour of the text and the background, or the size of the text. It may be possible to have the text read out to the user. Whatever features are used, it is important these can be adjusted by the user.

b) Any reasonable answer, for example: Deaf people would need sound translating to text. For example, they would need subtitles on videos.

c) Any reasonable answer, for example: You could use a simple coding system you design yourself but there are widely used systems that are known and understood by many people. See http://www.britishsignlanguage.com/ for more information about British sign language.

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Chapter 12

Exercise 12.1

1 **a)** Any reasonable answer, for example:

Type of sensor	How data could be useful to the council
Light sensor	An indication of when street lights are needed could help provide this service at appropriate times and predict the cost of provision.
Wind speed sensor	This could activate warning signs on roads where vehicles are very exposed to wind and could help councils know when to alert emergency services.
Rain gauge	This could be used to predict the likelihood of flooding

b) Any reasonable answer, for example:

- They could sample a range of related factors, such as, temperature and humidity.
- Over a period of time they could identify what values of these factors lead to icy road conditions.
- New readings can be compared to these values. If they are within range then icy road conditions would be predicted.

c) Any reasonable advantage, for example:

- As the weather station is connected to a computer network, data can be collected over the network. It can be collected more frequently, at any time of the day or night and at little additional cost.
- Collecting the data using the network reduces the need to send employees to the weather station. Sending employees could be relatively expensive and there may be dangers depending on the location of the weather station.

Any reasonable disadvantage, for example:

- An employee visiting the weather station will do more than simply collect the data. For example, they could check if the weather station is functioning as it should or whether it has been vandalized.
- Some employees may be made redundant as there is less work for them to do.

d) Any reasonable answer, for example:

- It can be used to monitor the operation of the weather station.
- It can be used to check on the accuracy of the data from the weather station.
- It deters vandalism.

e) Any reasonable advantage, for example:

- The council can monitor what is happening throughout their district and this will help them decide how to respond and where to respond.
- The cameras can be used to deter crime.

Any reasonable disadvantage, for example:

- There is a lack of privacy. Many law abiding citizens may resent being filmed wherever

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they go.

- Someone has to be employed to observe the cameras and an observation facility has to be funded.

2 **a)** Any reasonable answer, for example: Process control is the use of computers to monitor industrial manufacturing processes. If the computer senses that that something is wrong, it may take corrective action, alert human workers or both.

b) Any reasonable answer, for example:

- The chemical industry might use process control to manufacture chemicals.
- Process control is also used in nuclear power generation.

c) Any reasonable advantage, for example:

- Processes can be monitored every minute of every day.
- Monitoring is reliable provided the control system is working correctly.
- Dangerous processes can be monitored without risk to human workers.

Any reasonable disadvantage, for example:

- If the control system malfunctions, it is possible for the computer to believe that the process is under control when it is dangerously malfunctioning.
- It is prudent to have human supervision which is an additional cost.

3 **a)** Please see the Glossary.

b) Any reasonable answer, for example: Robots are used in car manufacturing and in packaging.

c) Any reasonable answer, for example:

- In car manufacturing, robots are used for: assembling components, welding body panels and paint spraying.
- In packaging, robots are used to automatically recognise empty packets, fill them and to recognise full packets.

d) Any reasonable advantage, for example:

- Robots can perform repetitive tasks more reliably than human workers.
- For large production volumes, it is likely robots will produce a more consistent product at a lower cost than a human worker.
- Robots can work in dirty and dangerous conditions which might be uncomfortable for a human worker.

Any reasonable disadvantage, for example:

- Robots are expensive to purchase.
- Robots have difficulty doing jobs which are not well defined, for example, re-plumbing a bathroom.
- Robots require maintenance and repair.

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Exercise 12.2

1 **a)** Any reasonable answer, for example: One of the most important tasks any business must do and do well is to pay its employees. Every business has to do this and it is easier to do this using a computer.

b) Please see the Glossary.

c) Please see the Glossary.

d) Any reasonable answer, for example: Payroll can be processed using batch processing because the data to be processed is gathered together before processing begins. It does not have to be processed in real time.

2 **a)** Any reasonable answer, for example:

- Go to a travel agent who will access the airline's online booking system.
- Go to the airline's web page and book online.

b) Any reasonable answer, for example: Because many travel agents in many different places will want to access the online booking system at the same time.

c) Please see the Glossary.

d) Any reasonable answer, for example: Real time processing is appropriate because potential passengers need to know whether there are seats available. This information needs to be accurate otherwise there may be double booking which may lead to passengers being unable to fly when expected. This will damage the good reputation of the airline and disappointed passengers will seek compensation.

e) Any reasonable answer, for example: An exact replica of the main flight information and booking file is made as bookings are processed.

3 **a)** Any reasonable answer, for example:

- Bar code scanner
- Receipt printer
- Speaker
- Credit card reader
- Network connection
- Terminal including screen, keyboard and cash tray

b) Any reasonable answer, for example: Product code and check digit. If you are claiming that the price or weight is stored in the bar code then you should explain that this is an exceptional arrangement that may be used with vegetables that customers choose and pick themselves.

c) Any reasonable answer, for example: Items for sale have a bar code on them. The bar code is scanned at the checkout. The bar code is sent to the main computer where it is matched with its record on a database type system. The name and price are stored in its record. These are sent to the checkout and printed on the itemized receipt.

d) Any reasonable answer, for example: The record stored on the main computer for each product will have fields for the amount in stock and the reorder level. The ICT system knows that goods need reordering when the amount in stock falls below the reorder level.

e) Any reasonable answer, for example:

- Automatic stock keeping and reordering.

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- Itemized receipts for customers.
- Faster checkout using bar code scanners, compared with manual tills.
- ICT system can be used for additional tasks and generate additional information with little further effort compared with manual systems.

f) Any reasonable answer, for example:
- Identifying goods which sell well so that the product range could be enhanced, and identifying goods which sell badly so that the product range could be reduced.
- Expected daily takings can be generated for reconciliation with cash and other receipts.
- Monitoring the work rate of checkout operators.

4 **a)** Please see the Glossary.

b) Any reasonable answer, for example:
- Architects use CAD to design buildings.
- Engineers use CAD to design car parts.

c) Any reasonable answer, for example:
- Designs can be produced faster and it is easier to edit them.
- Designers have access to pre-designed components which can make the design process faster and easier.
- The use of pre-designed and standard components that are already being produced can reduce the cost of production.

d) Any reasonable answer, for example: Specialised peripheral devices used with CAD include: light pen, digitizing tablet and plotter.

5 **a)** Please see the Glossary.

b) Any reasonable answer, for example:
- More consistent production quality as CAM systems are more likely to repeat operations precisely to the same standard.
- Re-design is easier as only the software needs editing. It is not usually necessary to retrain employees.

c) Any reasonable answer, for example: A wide range of systems are used for the manufacture of different items such as cars and carpets.

6 **a)** Any reasonable answer, for example: the customer's PIN number.

b) Please see p.260.

c) Any reasonable answer, for example: The PIN keeps the customer's bank account secure by helping to ensure that only the customer has access to it.

d) Any reasonable answer, for example: When a customer tries to withdraw money from an ATM, a check is carried out to ensure there is sufficient money in their account to fund the withdrawal. If there is not, the bank can automatically block the withdrawal.

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7 **a)** Please see the Glossary.

b) Any reasonable answer, for example: The customer puts their debit card in a card reader and enters their PIN. The purchase price is automatically credited to the retailer's bank account and deducted from the customer's bank account.

c) Any reasonable answer, for example:

- A smart card has an embedded microchip that can store more information than a magnetic stripe.
- Smart cards are more secure as it is more difficult to alter the information on the microchip than that on a magnetic stripe.

8 **a)** A Virtual Learning Environment. This is an online, structured store of information.

b) Any reasonable answer, for example: Examples of a VLEs in common use are Blackboard and Moodle. Depending on how they have been set up, they can:

- Support downloads of files, such as information documents, worksheets, PowerPoint presentations, video and audio.
- Provide communication facilities for email, discussion boards, wikis and glossaries.
- Provide online storage for students, both private and shared.
- Provide information about grades awarded for assignments.

c) Any reasonable answer, for example:

- All the information about a course is available in one place.
- Easy access to learning materials and details of assignments, usually at any time and with access via the web.
- A record of progress may be available.

d) Any reasonable answer, for example:

- A wider range of learning materials can be made available to students.
- Learning materials can be made available anywhere there are networked computers with web access.

e) Any reasonable answer, for example:

- Lack of availability of networked computers with web access.
- Teaching involves many activities which do not necessarily involve use of a VLE. For example, discussion.

f) Any reasonable answer, for example:

- Students can research relevant project materials.
- Video clips can be accessed and played on a PC or a multimedia projector and whiteboard.

9 **a)** Any reasonable answer, for example:

- The police can search databases using partial knowledge of a suspect and be given a list of possible suspects to investigate.
- Using GIS systems, the police can overlay road maps with layers that show what offences are committed and when. This helps them send police officers to areas where offences are likely to be committed and at the time they are likely to be committed.

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b) Any reasonable answer, for example:

- Standard legal documents can be made more accessible and filling them in can be automated.
- Expert systems can be used to help lawyers find appropriate ways of defending clients.

10 a) Any reasonable answer, for example: Name, address, date of birth (NOT age) and a record of illnesses.

b) Any reasonable answer, for example:

- A local doctor can fill in a patient's medical record and this is then available at the hospital the patient attends, and vice versa.
- If a doctor prescribes by mistake a medicine the patient is allergic to, the ICT system can alert the doctor to this and block the prescription.
- The effectiveness of treatments can be monitored across the whole population.

c) Any reasonable answer, for example:

- Each doctor and other authorised users should have their own username and password. Unauthorised users would not have these and so would not have access to the ICT system.
- Computers used to access medical records should be in areas which have controlled or supervised access.
- Use CCTV to monitor who uses the computers and investigate unauthorised users.

d) Please see the Glossary for a definition of an expert system. A medical expert system is one that provides information about medical conditions and their treatment.

e) Any reasonable answer, for example:

Advantages:

- Doctors have access to the latest information and this is targeted on the conditions they are treating.
- The range of information can be far greater than an individual doctor could access without an expert system.

Disadvantages:

- A doctor may be able to consider a wider range of factors that are personal to the patient.
- If the expert system is not up-to-date, doctors will assume it is and use out of date treatments.

e) Any reasonable answer, for example:

- Monitoring of patients on life support machines.
- Re-presentation of images from MRI and CAT scanners into a form doctors can more easily understand.
- Telemedicine can help doctors treat patients at a distance where expert medical help is difficult to access.

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Exercise 12.3

1 **a)** Please see Glossary

b) Any reasonable answer, for example: Computer (keyboard, system unit, monitor, DVD drive, USB ports, speakers) with scanner and printer. Wireless access point, router and modem with broadband Internet access.

c) i. Any reasonable answer, for example:

Advantages:

- Saves time taken to commute from home to work, and cost of commuting.
- Can be more flexible about when work is done and can fit this around other commitments, such as dentist appointments, without loss of working time.

Disadvantages:

- Work can intrude on the worker's time with the family at home.
- Increased domestic heating bills.

ii. Any reasonable answer, for example:

Advantages:

- Can reduce costs as no need to provide office space for every worker every day.

Disadvantages:

- Has less control over what workers are doing and when.
- Reduced synergy from workers collaborating.

iii. Any reasonable answer, for example:

Advantages:

- Reduced carbon emissions as few commuters' cars on the road.
- Less road congestion.

Disadvantages:

- Possible reduction in car parking charges collected.
- Possible reduction in rates due to shops closing as customers stay at home and consume less.

2 **a)** Any reasonable answer, for example: The right of individuals to determine what information is stored about them and how that information will be used.

b) Please see p.282.

c) Any reasonable answer, for example:

- If an individual's medical record is made public, this may make it difficult for them to arrange life insurance.
- If someone has a criminal record which shows that they committed drugs offences when they were young, this might prevent them being employed in some jobs, even though the offence was many years ago and the person has not offended since.

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3 Any reasonable answer, for example:

- Attach the computer to a desk or similar.
- Keep the computer out of sight of passersby.
- Keep computers in a room not on the ground floor where they will be less accessible to thieves.
- Install burglar alarms.

4 Any reasonable answer, for example:

- Usernames and passwords required for logon.
- Use virus scanners and firewalls to protect software and data from malicious downloads.
- Take regular backups.

5 **a)** Please see Glossary.

b) Any reasonable answer, for example: Software takes time and effort to construct, and programmers and others need an income so that they can continue to improve and create software. Piracy robs them of this income.

6 **a)** Please see Glossary. Hacking is an illegal activity where an unauthorised user of a computer system breaks into an ICT system, possibly by discovering a valid User Identification Number and its associated password, or by bypassing them.

b) Any reasonable answer, for example: Hacking is often malicious. Its purpose is to do damage to computer systems or data, or steal funds from online bank accounts. Hacking is illegal because other people do not want their computer systems damaged as they may be costly or difficult to replace; and they do not want others stealing their funds.

7 Any reasonable answer, for example:

- A phishing email which seems to have been sent by your bank and invites you to access their website to update your password. To avoid having your money stolen, always break the connection between the phishing email and your access to your bank's website. That is, type in your bank's web address independently of the phishing email.
- The Nigerian scam. Delete the email. Do not reply to this email even to complain as this confirms your email address and you will receive more emails of the same type and spam.

8 **a)** Any reasonable answer, for example:

- Doctors who are authorised to use the system must log on using their own username and password.
- Ensure the network is inaccessible to unauthorised users by monitoring computer use and preventing illegal network connection by hiding and otherwise securing network cables and ensuring wireless networks are security enabled.

b) Any reasonable answer, for example:

- Set up access permissions so that unauthorised users cannot see or open secure files.
- Put passwords on the files.

9 Any reasonable answer, for example:

- Repetitive strain injury. To help avoid this do not use a keyboard for prolonged periods of time.
- Eye strain. To help avoid this do not sit and stare at the monitor for prolonged periods of time. Take a break every hour.
- Back ache. Ensure good posture when sitting at a computer. For example, the seat should be fully adjustable to allow a comfortable seating position. Use a wrist rest to prevent bruising to the wrists.

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10 a) Any reasonable answer, for example:

- Someone else has the responsibility for the security of the information on the database so that you cannot be sure your privacy is safeguarded.
- You cannot be sure what the information will be used for.

b) Any reasonable answer, for example:

- The police officer can use details given by witnesses to a crime to find a list of possible suspects and investigate these.
- A police officer can enter a car's registration number and find out if the owner has paid road tax and car insurance, or whether the car is stolen.
- A police officer can wear video glasses which scan the faces of the people they meet. Face recognition software linked to a database can be used to identify whether the police officer is looking at someone who has been convicted of a crime.

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