Candidate surname | Other names

Centre Number | Candidate Number

Pearson Edexcel International Advanced Level

Monday 5 June 2023

Afternoon (Time: 2 hours) | **Paper reference** **WIT13/01**

Information Technology
International Advanced Level
UNIT 3

You do not need any other materials. | Total Marks

Instructions

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

Information

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

Advice

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

Turn over ▶

Pearson

Answer ALL questions in this section.

Write your answers in the spaces provided.

1 Manufacturers use IT systems to create new products.

   (a) Project managers use many tools, such as SMART targets, to do their jobs.

     (i) Name **two other** tools that are used in project management.

(2)

1 ....

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2 ....

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     (ii) State the meaning of the **A** in **SMART** targets.

(1)

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     (iii) Give **one** reason for using SMART targets to define project outcomes.

(1)

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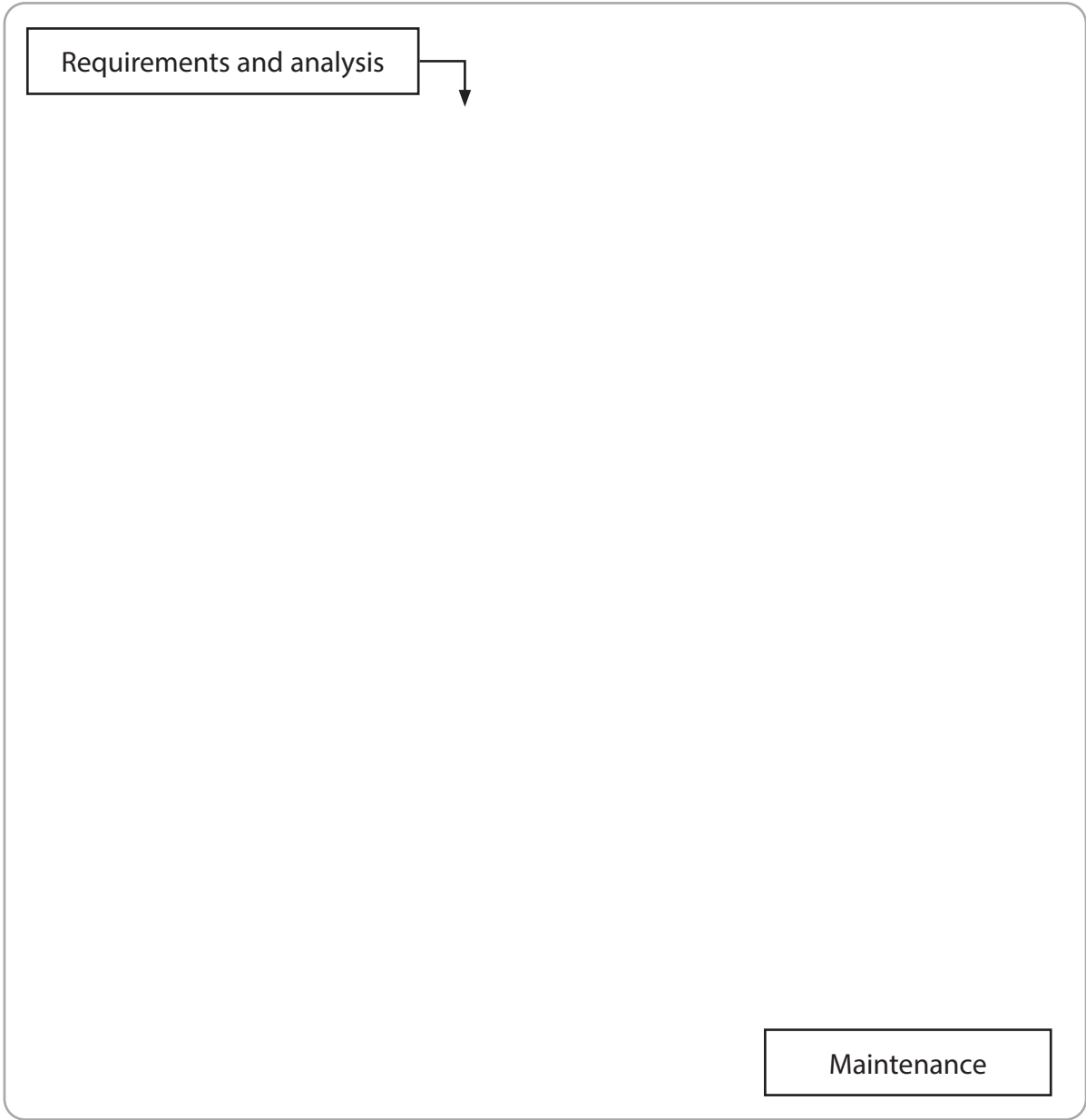
(b) Complete the diagram to show the steps of the waterfall method of systems development.

The first and last steps are shown for you.

(2)

Requirements and analysis

Maintenance

P 7 2 6 0 5 A 0 3 2 0

(c) A team of developers is working on a new software product.

The team uses computers on a local network to develop the product.

However, the finished product will be installed and run on cloud servers.

Explain **one** advantage of using containerisation to deploy the finished product to the cloud.

(2)

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(d) An aeroplane manufacturer is considering developing a virtual reality flight trainer for its aeroplanes.

Discuss the benefits and drawbacks of using virtual reality in the flight trainer.

(6)

(Total for Question 1 = 14 marks)

2 Retail stores use databases.

(a) Normalising a relational database reduces data redundancy because it removes duplicate data.

Explain **one other** benefit of normalising a relational database.

(2)

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(b) A water sports store rents canoes, paddleboards and kayaks to customers.

The store uses a database.

(i) The database has rules to ensure that any data entered is valid.

Complete the table to name the type of validation used to identify invalid data.

(2)

| Information	Valid data	Invalid data	Validation type
Equipment names	Paddleboard Kayak Fishing canoe	<blank>	
Rental period in hours	1 to 24	30	

(ii) The water sports equipment rented to customers is regularly inspected by qualified technicians.

Complete the diagram to show a logical model of the database.

You **must** include:

- two additional entities
- four relationships and relationship types.

(6)

Equipment

Customer

Technician
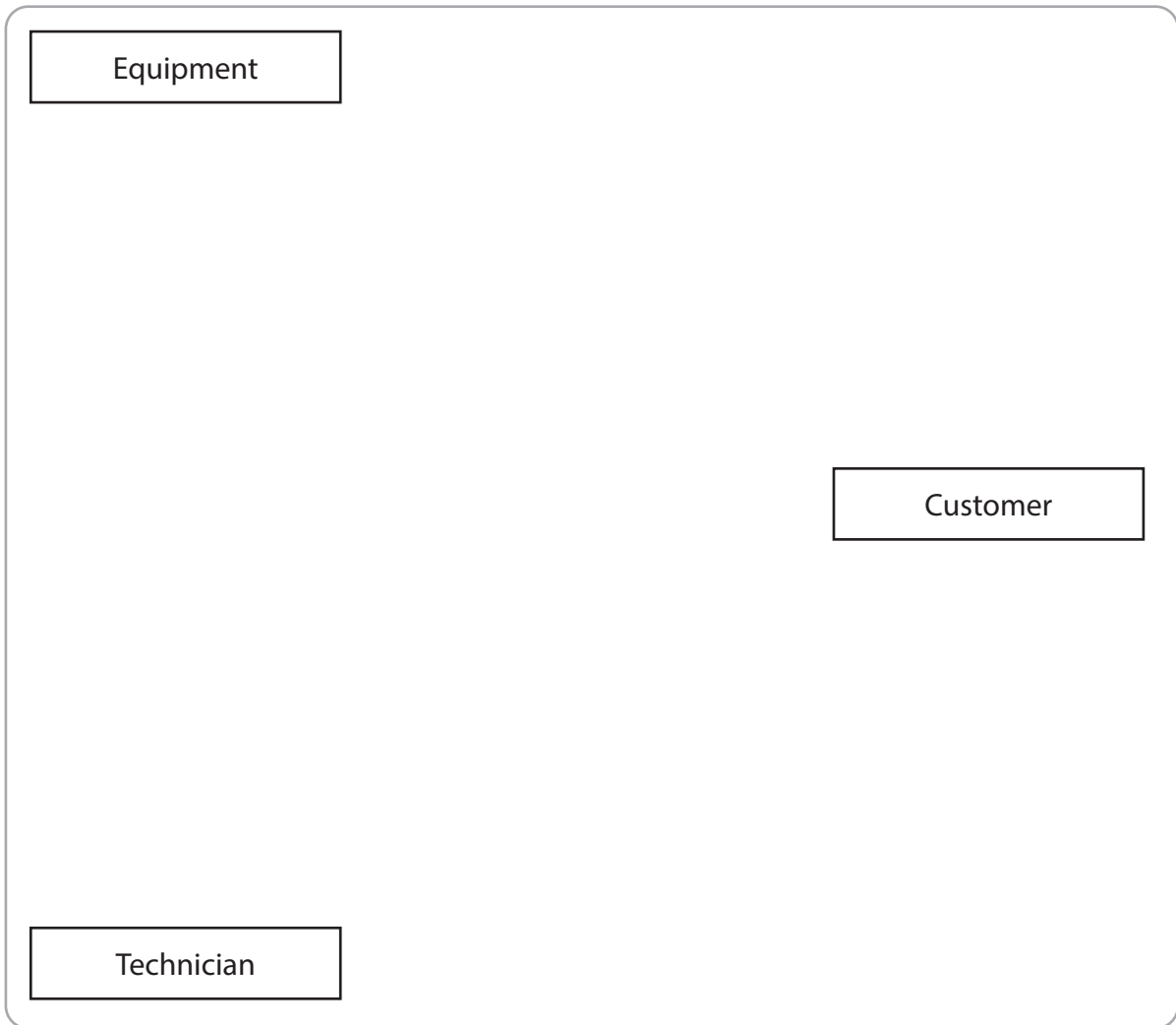
(Total for Question 2 = 10 marks)

3 Encryption is used to protect data that is being transmitted over the internet.

(a) One type of encryption relies on a certificate.

(i) A certificate includes general items, such as the date of issue.

Give **one** non-general item found in a certificate.

(1)

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(ii) Describe the role of a Certificate Authority in the use of certificate-based encryption.

(2)

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(b) Symmetric and asymmetric are two types of encryption.
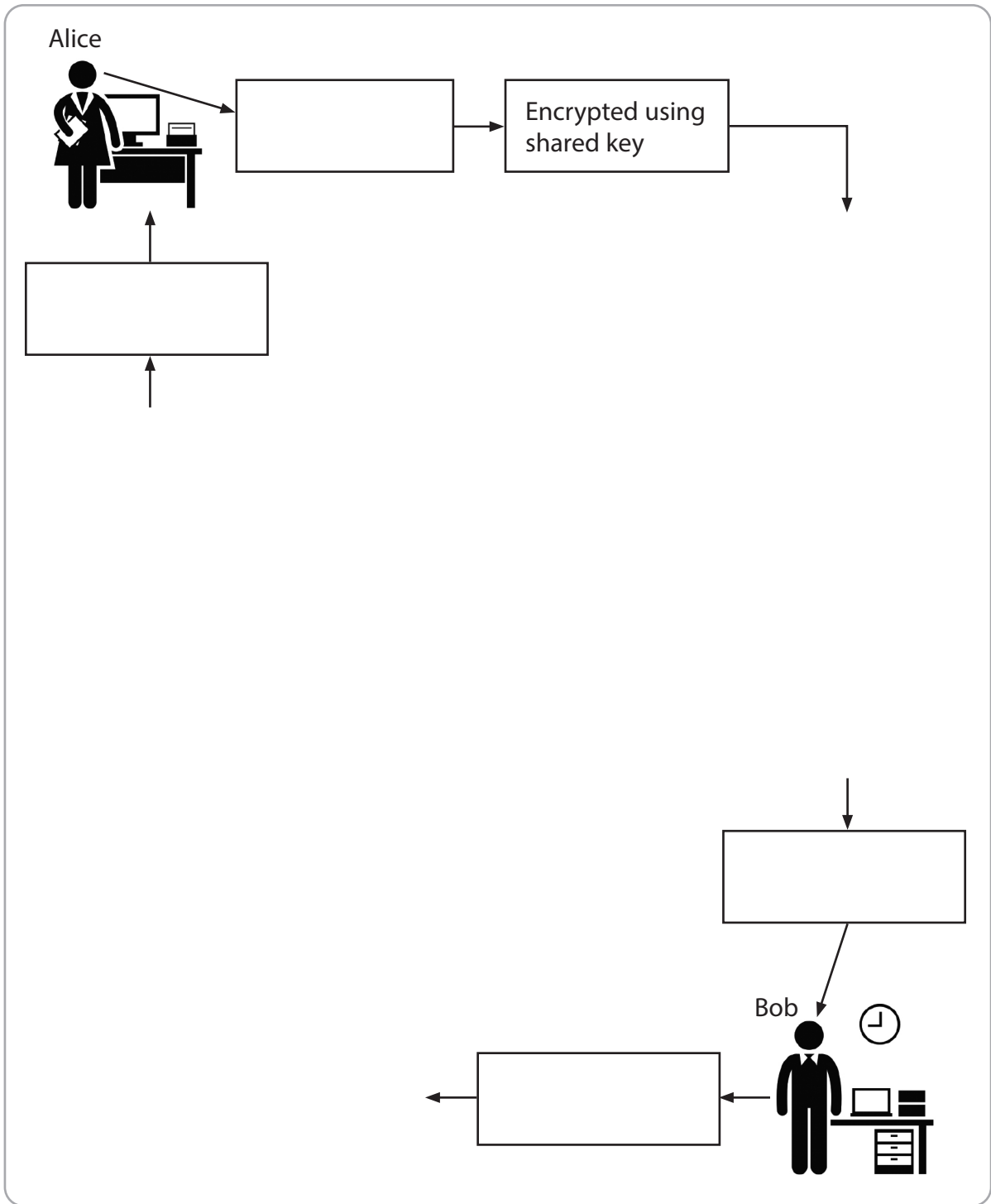
Alice sends a message to Bob using symmetric encryption.

Bob sends a message to Alice using asymmetric encryption.

Complete the diagram to show the steps required for the messages to be exchanged.

You **must** include plaintext, ciphertext and types of keys.

(9)

Alice

[ ] → Encrypted using shared key →

[ ]

Bob

[ ]

[ ] ← [ ] ←

(Total for Question 3 = 12 marks)

4 A retailer has stores all over the country.

(a) The retailer has a customer loyalty scheme.

Customer data is stored on the customer relationship management (CRM) system.

Figure 1 shows some of the fields used in the CRM system.

Field	Description
1	Customer number
2	Date of last store visit
3	Products bought in last visit
4	Code of last promotional email sent
5	Code of last promotional postal brochure sent
6	Date of last call to customer service phone line
7	Length of time waiting in customer service phone queue
8	Length of time to deal with the problem

Figure 1

The customer loyalty scheme could use fields 1 and 3 to identify a customer's favourite items, so that the customer can be sent a voucher.

(i) Explain **one other** way that the **customer services department** could use **two** of the fields used in the CRM system.

You **must** include the field numbers in your explanation.

(2)

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(ii) Explain **one** way that the **marketing department** could use **three** of the fields used in the CRM system.

You **must** include the field numbers in your explanation.

(2)

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(b) The retailer plans to replace its existing IT systems.

The systems being replaced are accounting, record keeping, purchasing and electronic points of sale.

The retailer is planning ways to make the changeover from existing systems to new systems.

Complete the table to give the type of changeover method in each case.

(4)

Plan	Changeover method
The accountants at every retail store will use both the existing accounting software and the new accounting software for the next month.	
Head office will switch the records it holds for the stores in Liverpool to the new system and leave the records of the other stores on the existing system. It will switch the records of the other stores to the new system when the new system is working correctly.	
The retail stores will use the new electronic point of sale machines but will continue to use the existing purchasing system for another three months.	
The purchasing department at head office will close for a week so that the existing software is removed and the new software is installed on all computers in the department at the same time.	

(c) The retailer is reviewing its IT governance and policies.

Discuss the need for and features of risk management and disaster recovery policies.

(6)

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(Total for Question 4 = 14 marks)

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QUESTION 5 BEGINS ON THE NEXT PAGE.

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5 A store sells items used by swimmers.

The store currently keeps records of sales in a spreadsheet.

Figure 2 shows some of the most recent orders.

Manufacturers are listed in brackets in the stock_bought column.

order	stock_bought	date	customer
31890	1 goggles (Majestic) 1 ear plugs (Coggs) 1 towel (Majestic)	15/03/2021	Melody Mendoza
31910	2 ear plugs (Coggs) 2 caps (Latex Land)	17/03/2021	Barbara Burke
40220	2 nose clips (Coggs)	19/03/2021	Sara Sanchez
40240	1 goggles (Majestic) 2 ear plugs (Latex Land) 1 cap (Coggs)	19/03/2021	Sara Sanchez

Figure 2

The store wants to create a database to store the data.

Create tables showing the database in third normal form.

Primary keys **must** be <u>underlined</u>.

Foreign keys **must** be indicated by an asterisk *****.

Do **not** include any data in the tables.

(12)

(Total for Question 5 = 12 marks)

6 A conference centre is located in a big city.

It has meeting rooms, retail space, a hotel and an entertainment complex that includes a cinema and bowling alley.

(a) Visitors to the centre have access to information points to find their way around the conference centre.

Each information point has a display, a keyboard and a mouse.

Users can search for place names, product types and other amenities.

Draw a diagram in the space provided on the next page to show a suitable interface design for an information point.

You **must** include:

- at least two windows

- at least one icon

- at least one menu

- one pointer

- labels to identify a window, an icon, a menu and a pointer.
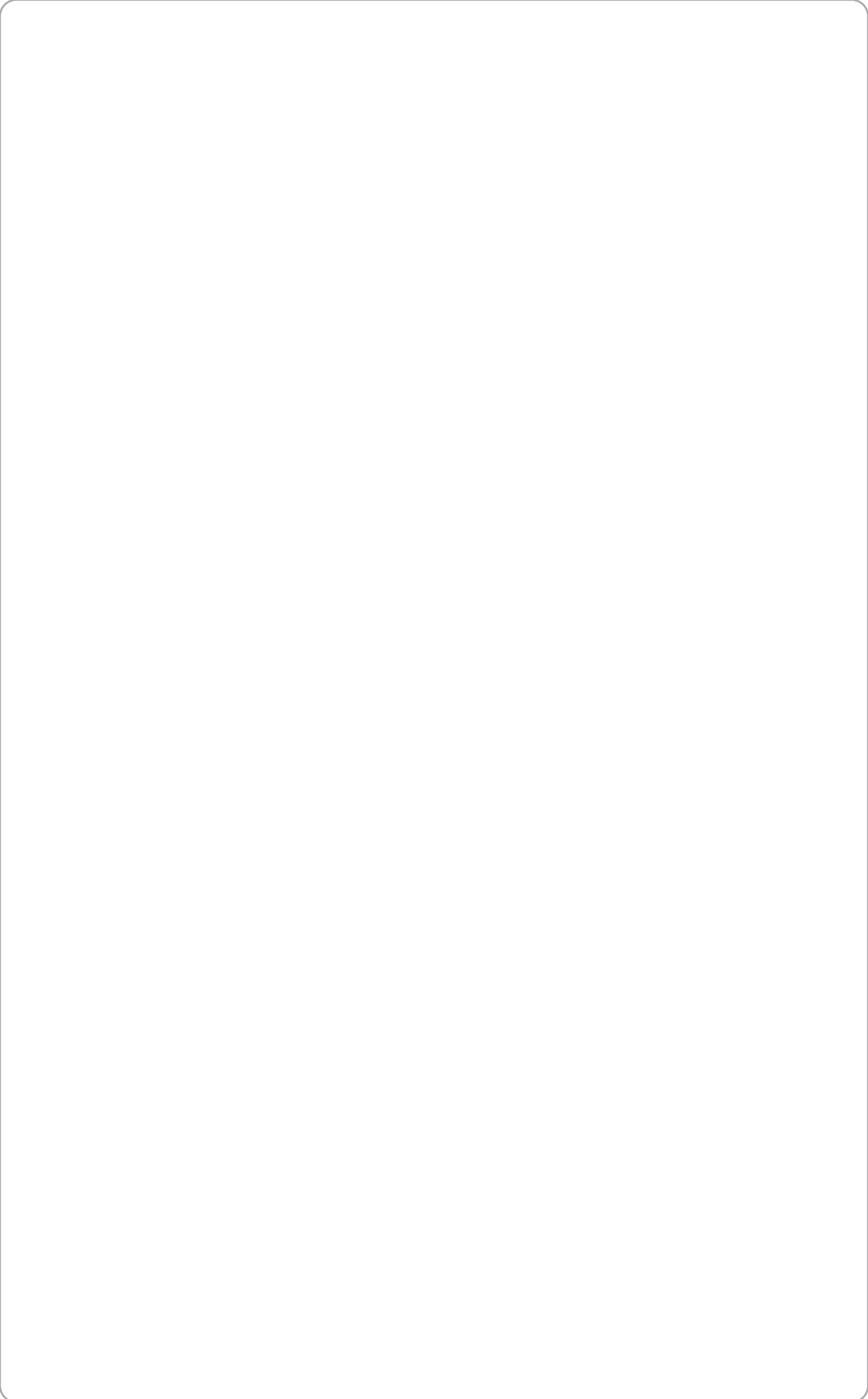
Do **not** indicate colours or fonts.

(6)

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(b) The conference centre's hotel allows guests to access movies, sports and their accounts using the TV and remote control in their rooms.

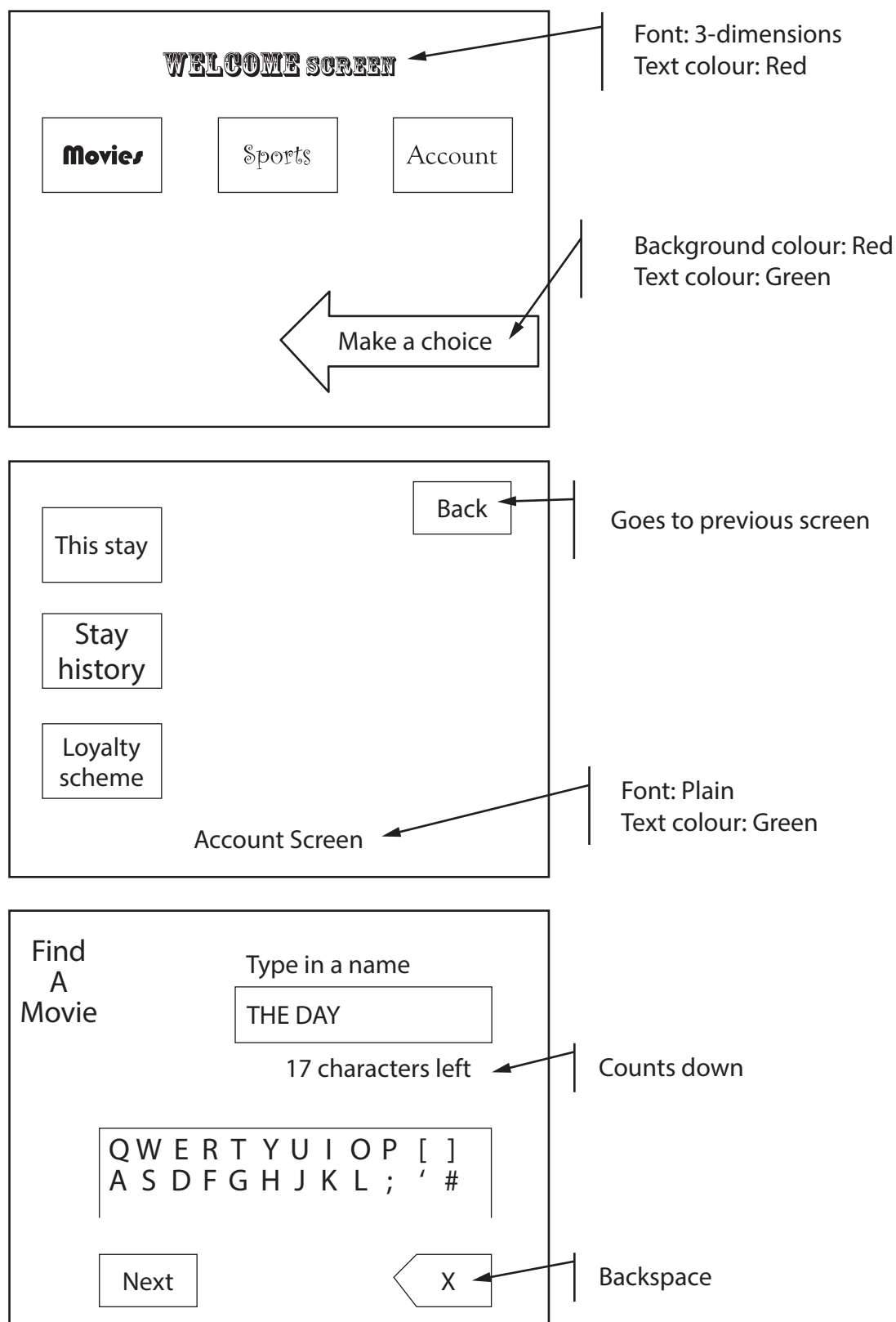Figure 3 shows designs for three of the required screens.

WELCOME SCREEN — Font: 3-dimensions / Text colour: Red

Movies   Sports   Account

Make a choice — Background colour: Red / Text colour: Green

Back — Goes to previous screen

This stay

Stay history

Loyalty scheme

Account Screen — Font: Plain / Text colour: Green

Find A Movie

Type in a name

THE DAY

17 characters left — Counts down

Q W E R T Y U I O P [ ]
A S D F G H J K L ; ' #

Next   X — Backspace

Figure 3

Evaluate the designs with respect to four rules of interface design.

You should consider:

- Rule 1: Strive for consistency

- Rule 2: Seek universal usability

- Rule 3: Offer informative feedback

- Rule 4: Permit easy reversal of actions for the user.

(12)

(Total for Question 6 = 18 marks)

TOTAL FOR PAPER = 80 MARKS

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