Question/Answer Booklet

COMPUTER SCIENCE

Please place your student identification label in this box (if required)

Year 11 ATAR: Unit 1

Student Number: In figures

In words

Time allowed for this paper

Reading time before commencing work: ten minutes
Working time: two hours and thirty minutes

Materials required/recommended for this paper

To be provided by the supervisor
This Question/Answer booklet
Source booklet

To be provided by the candidate
Standard items: pens, pencils, eraser, correction fluid/tape, ruler, highlighters
Special items: non-programmable calculators approved for use in this examination, Mathomat and/or Mathaid and/or any system flowchart template

Important note to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised material. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

Structure of this Paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of examination
Section One: Short answer	14~~4~~	14~~4~~	60~~70~~	64~~87~~	40
Section Two: Extended answer	4	4	9~~8~~0	96	60
				Total	100

Instructions to candidates

1. The rules for the conduct of the Western Australian Certificate of Education ATAR course examinations are detailed in the *Year 12 Information Handbook 2020*. Sitting this examination implies that you agree to abide by these rules.

2. Write your answers in the spaces provided in this Question/Answer booklet. A blue or black pen should be used. Wherever appropriate, fully labelled diagrams, tables and examples should be used to illustrate and support your answers.

3. You must be careful to confine your answers to the specific questions asked and to follow any instructions that are specific to a particular question. Where no specific instructions are given, you should feel free to use a range of formats to express your knowledge and understandings.

4. Additional working space pages at the end of this Question/Answer booklet are for planning or continuing an answer. If you use these pages, indicate at the original answer, the page number it is planned/continued on and write the question number being planned/continued on the additional working space page.

Section One: Short answer   **40% (6487 marks)**

This section contains **144** questions. You must answer **all** questions. Write your answers in the spaces provided.

Supplementary pages for the use of planning/continuing your answer to a question have been provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Suggested working time: 670 minutes.

_____

Question 1   **(5 marks)**

a) Describe the role of the system clock in the fetch execute cycle?   (2 marks)

_____

_____

_____

_____

b) The Central Processing Unit (CPU) is made up of several components other than the system clock. Choose one of these components and describe what it does.   (3 marks)

Name of component:_____

Description: _____

_____

_____

_____

Question 2 **(25 marks)**

State two (2) advantages of using a solid-state drive (SSD) over a mechanical disk (HDD) to store data in a personal computer. (2 marks)

Advantage 1: _____

_____

Advantage 2:_____

_____

Question 3 **(1 mark)**

Suggest a physical preventative maintenance measure for the following scenario.

A power surge due to a lightning storm destroyed a home computer plugged into the home power mains.

_____

_____

_____

Question 4 **(1 mark)**

State how many bits are contained in a megabyte.

_____

See next page

a) A mechanical disk (HDD) is which type of storage? (1 mark)

Circle the correct response.

Primary Storage Secondary Storage

b) Outline **one (1)** reason to justify your selection from the previous question (question 2b). (2 marks)

_____

_____

_____

_____

_____

Question 5   **(6 marks)**

a) Explain how cache plays a role in speeding up processing time.   (3 marks)

_____

_____

_____

_____

_____

_____

b) Cache is which type of storage?   (1 mark)

Circle the correct response.

        Primary Storage   Secondary Storage

c) Outline **one (1)** reason to justify your selection from the previous question
    (question 53b).   (2 marks)

_____

_____

_____

_____

_____

_____

Question 6 ——————————————————————————————— **(3 marks)**

Suggest a physical preventative maintenance measure for the following scenarios.

A power surge due to a lightning storm destroyed a home computer plugged into the home power mains.

_____

_____

_____

Your CPU temperature is increasing due to restricted airflow on the outside of the case near the intake fan.

_____

_____

_____

Sun and heat damage to a desktop computer near the window of an office desk.

_____

_____

_____

Question 7   **(3 marks)**

a) State **one (1)** advantage prototyping has over the System Development Life Cycle (SDLC).

(1 mark)

_____

_____

_____

b) Describe the role of the user when prototyping is used to develop a new system.

(2 marks)

_____

_____

_____

_____

_____

Question 8   **(3 marks)**

Project management often refers to terms such as planning, scheduling, budgeting and tracking. Define the term 'tracking' and state why it is an important step to ensure the project's success.

Definition:_____

_____

_____

_____

Importance:_____

_____

_____

_____

Question 9   **(4 marks)**

a) Outline what happens in the design phase of the System Development Life Cycle (SDLC).

(2 marks)

_____

_____

_____

_____

_____

_____

b) Describe the purpose of ~~an Entity Relational Diagram~~a context diagram ~~(ERD)~~?   (2 marks)

_____

_____

_____

_____

_____

_____

Question 10 (4 marks)

Outline **four** errors in the following level 0 data flow diagram below.
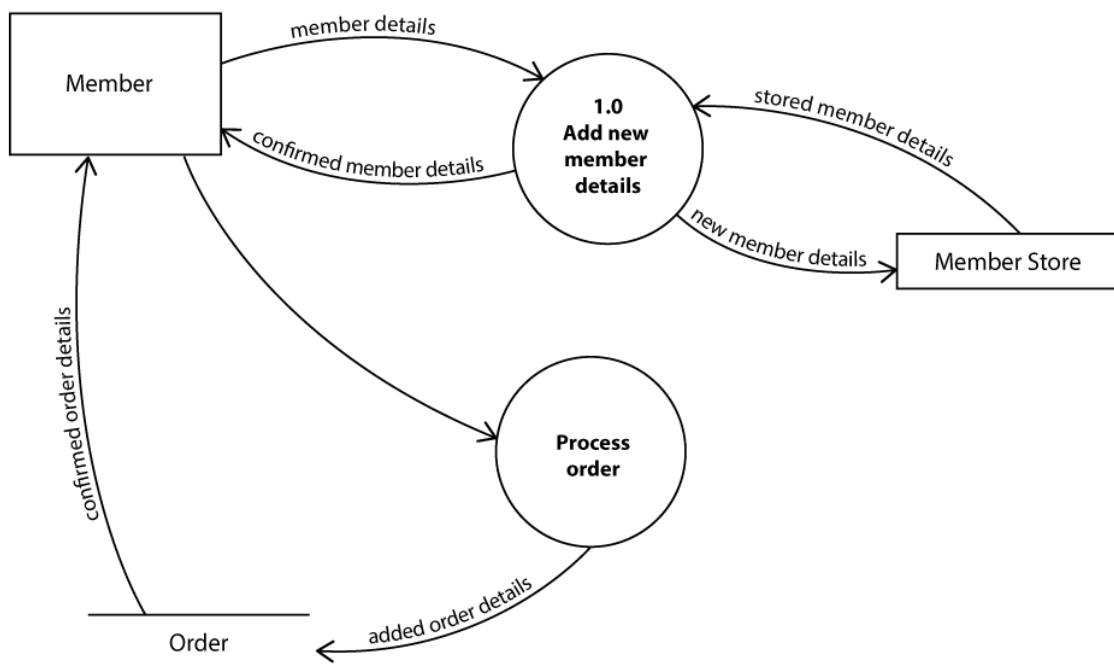
One: _____

_____

Two: _____

_____

Three: _____

_____

Four: _____

_____

Question 11 **(8 marks)**

Use the image below to answer all parts of this question about spreadsheets.

	A	B	C	D	E	F
1		CPU's R-US!				
2						
3						
4	Invoice					
5						
6	ProductID	Product	Price	Quantity	Subtotal	
7	007	Intel Core i9-9900K	$ 809.00	3	$ 2,427.00	
8	004	AMD Ryzen 5 3600X	$ 336.34	2	$ 672.68	
9						
10						
11						
12				5	$ 3,099.68	
13						
14	ProductID	Product	Price	GST	10%	
15	007	Intel Core i9-9900K	$ 809.00		$ 309.97	
16	006	AMD Ryzen 9 3950X	$ 826.12			
17	005	Intel Core i7-9700K	$ 629.99		Total $ 3,409.65	
18	004	AMD Ryzen 5 3600X	$ 336.34			
19	003	Intel Core i5-8600K	$ 506.44			
20	002	Intel Core i3-8350K	$ 310.95			
21	001	AMD Ryzen 5 2400G	$ 198.58			
22						
23						

CPU's R-US! Want to automate their manual invoicing system. They have decided to use a spreadsheet. With this new system, they simply need to enter a ProductID in column A as well as a quantity in column D. The product name and price are both propagated from the data in cells A15:C21.

a) Complete the formula that is being used in cell C7 to retrieve the price of the CPU?

(4 marks)

=VLOOKUP(, , ,)

b) The last argument in the VLOOKUP formula is a range lookup which can be "true" or "false". State what it means when we set this to "false"? (1 mark)

_____

_____

c) A cell is a box in which you can enter a single piece of data. What spreadsheet terminology is used to identify the data in cell B6? (1 mark)

_____

d) Write the functions to find the total in cell E12. Your function should add to the subtotal if another product is entered. (2 marks)

See next page

Question 12 ────────────────────────────────── **(3 marks)**

Match each of the following terms with its alternative name in the table below. One has been done for you.
- Table
- Attribute
- Character
- Record

Database term	Alternative name
Entity	Table
Byte	
Tuple	
Field	

Question 13   **(79 marks)**

a) State what the following boot process acronyms stand for.   (2 marks)

The first has been done for you.

OS: Operating System

BIOS: _____

POST: _____

See next page

b) Outline the **five (5)** key steps of the boot process.   (5 marks)

One:_____

_____

Two:_____

_____

Three:_____

_____

Four:_____

_____

Five:_____

_____

THIS PAGE HAS BEEN LEFT BLANK DELIBERATELY

During the boot process the following error occurred.

```
Error loading operating system

BOOTMGR is missing
Press Ctrl+Alt+Del to restart
_
```
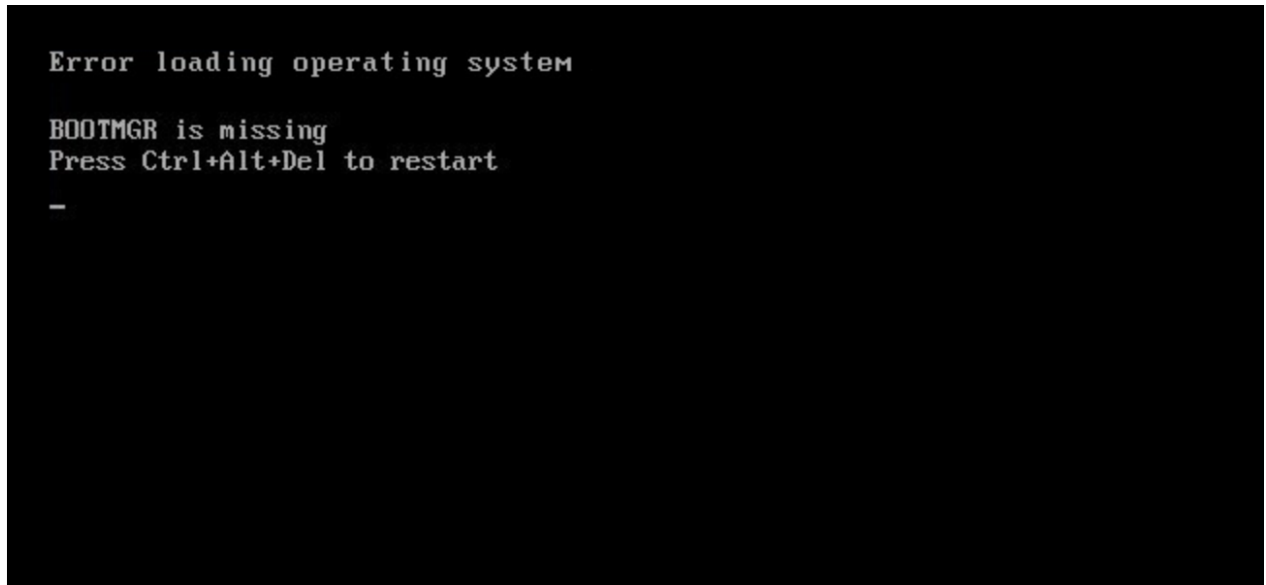
c) State **two (2)** possible reasons for this error to be displayed.   (2 marks)

One:_____

_____

Two:_____

_____

Question 14 ———————————————————————— **(5 marks)**

a) Identify **two (2)** reasons digital communication etiquette is so important for employees when using the company's Information and Communication Technology (ICT) systems.
(2 marks)

One:

Two:

b) State **three (3)** rules you would implement for good digital communication etiquette in a company environment.   (3 marks)
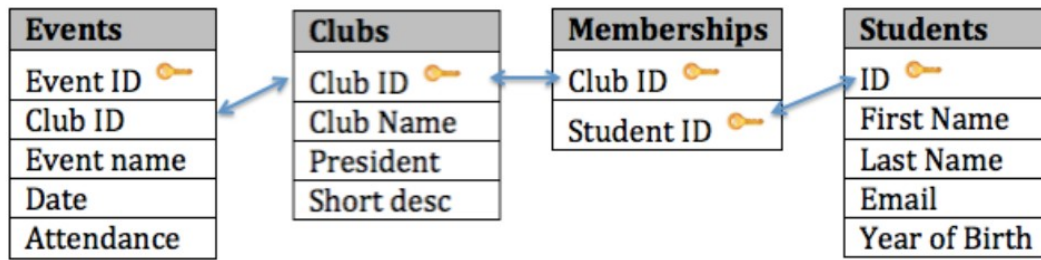
Rule 1:

Rule 2:

Rule 3:

Question 15 -   (1~~0~~8 marks)

Use the image below to answer all parts of Question 1~~23~~ about database terms.

Events	Clubs	Memberships	Students
Event ID 🔑	Club ID 🔑	Club ID 🔑	ID 🔑
Club ID	Club Name	Student ID 🔑	First Name
Event name	President		Last Name
Date	Short desc		Email
Attendance			Year of Birth

a) Describe each of the following terms and provide **one (1)** example for each from the table structure above.

(6 marks)

Primary Key:_____

_____

_____

Example (Primary Key):_____

Attribute:_____

_____

_____

Example (Attribute):_____

Relation:_____

_____

_____

Example (Relation):_____

———

See next page

b) List **one (1)** foreign key from the tables above.   (1 mark)

_____

c) Explain which data type you would use for the following: (3 marks)

Events Date:_____

Students First Name:_____

Students ID:_____

Question 16   **(3 marks)**

Match each of the following terms with its alternative name in the table below.
One has been done for you.
  • Table
  • Attribute
  • Character
  • Record

Database term	Alternative name
Entity	Table
Byte	
Tuple	
Field	

See next page

d) The following describes the entity relationship (ER) diagram for Question 13. (9 marks)
a club can have one or more events
a club has many memberships
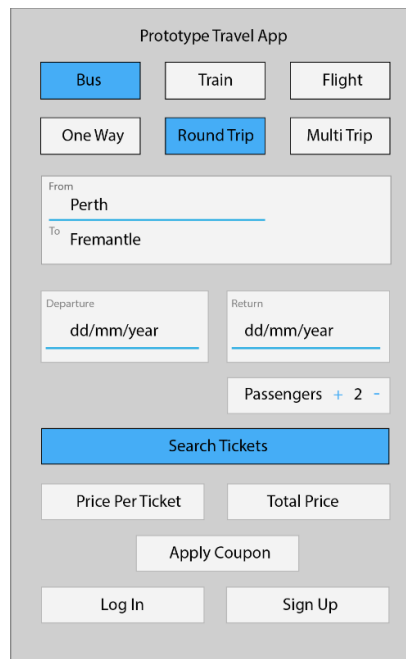a student can have many memberships to various clubs

Complete the entity relationship (ER) diagram making sure to label all entities, relationships, cardinality, primary and foreign keys. You do not need to include non-key attributes.
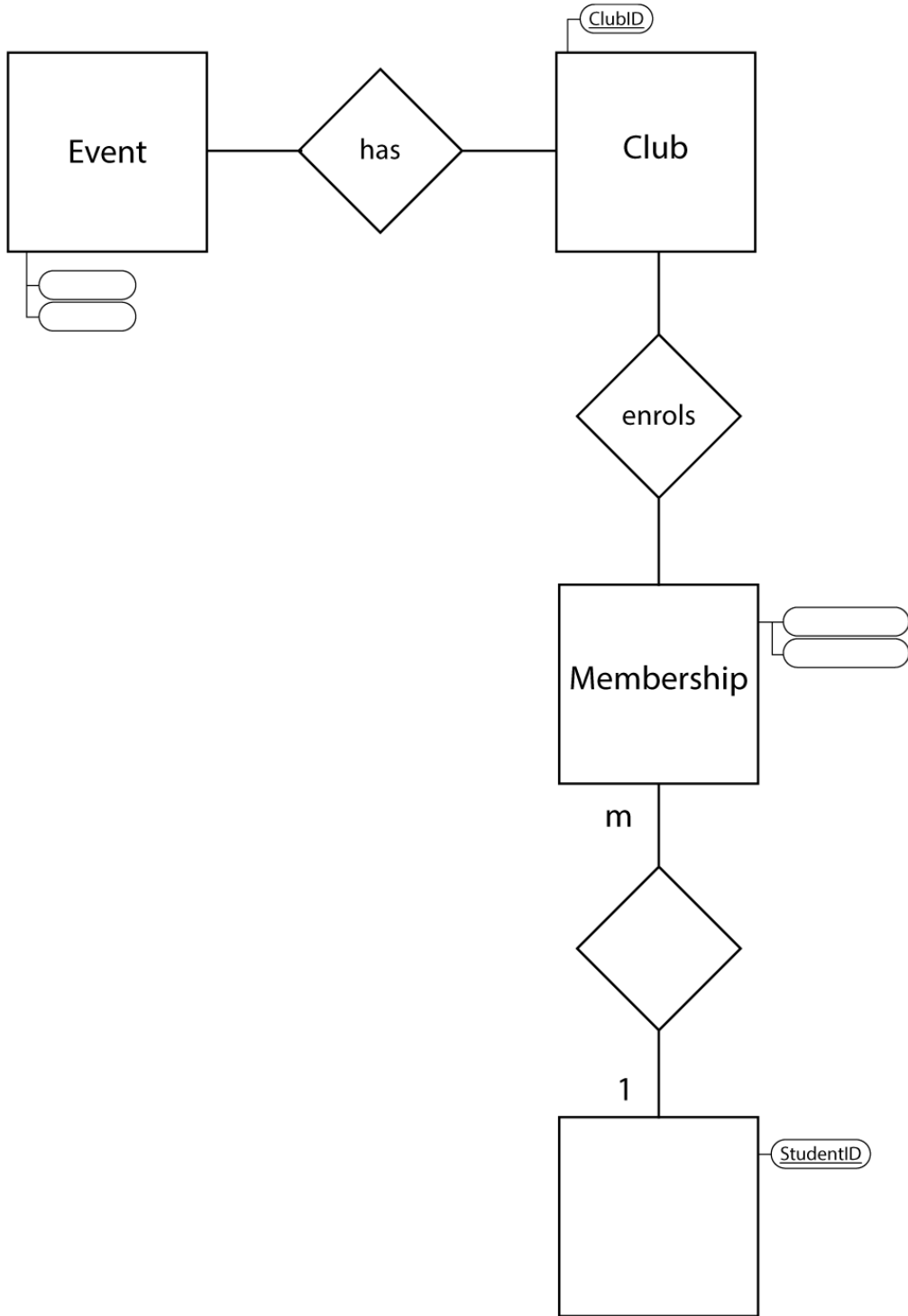
Question 17   (**79** marks)

Use the image below to answer all parts of Question 14 about visual interface design.

a) Comment on ~~two~~ one (**12**) strength~~s~~ and ~~two~~ one (**12**) weakness~~es~~ in the design of this
    visual interface for a prototype travel app.   (**24** marks)

Strength~~s~~

~~One:~~_____

_____

~~Two:~~_____

_____

Weakness~~es~~

~~One:~~_____

_____

Two:

b) The travel app will be collecting credit card details to pay for tickets. Explain how public and private key encryption could be used to protect this data.   (3 marks)

_____

_____

_____

_____

_____

_____

_____

c) Outline **two (2)** legal requirements the travel App would have if the organisation was to store information about individuals.   (2 marks)

One:_____

_____

_____

Two:_____

_____

_____

END OF SECTION ONE

PAGE LEFT BLANK INTENTIONALLY

THIS PAGE HAS BEEN LEFT BLANK DELIBERATELY

Section Two: Extended answer 60% (96 Marks)

This section has **4** questions. Answer all questions. Write your answers in the spaces provided.

Supplementary pages for the use of planning/continuing your answer to a question have been provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Suggested working time: 80 minutes.

_____

Question 18 **(40 marks)**

Refer to the Source booklet to answer this question.

a) The analyst has decided to use the System Development Lifecycle (SDLC) for the development of this project. Outline **two (2)** benefits of using the SDLC for project management. (4 marks)
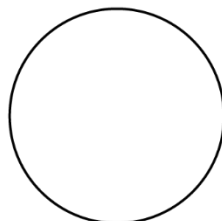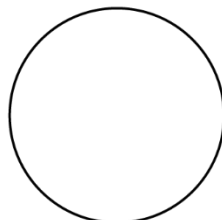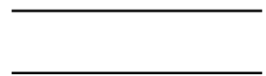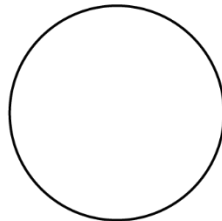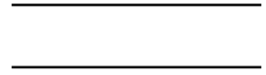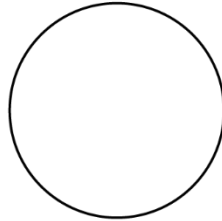
One:_____

_____

_____

Two:_____

_____

_____

b) The system analyst has chosen to model the design of the new system. Outline why the analyst might start with a context diagram? (2 marks)_____

_____

_____

_____

_____

c) Use the source booklet to complete the unfinished Context Diagram for the Kensington University's new system.   (10 Marks)
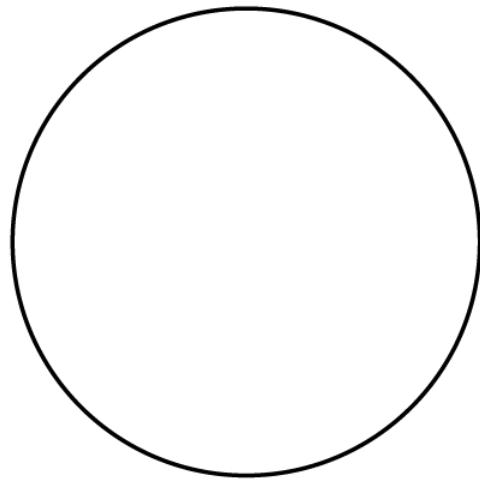
d) Use the source booklet to create the level 0 data flow diagram (DFD) for the system
   below.   (24 Marks)

Question 19   **(8 marks)**

Refer to the image in the source booklet and answer the following questions.

a) Examine the meeting room booking card. The analyst noted that the booking card is
    missing some important data. State **two (2)** pieces of data not currently being collected
    correctly and the likely consequence of these errors.   (2 marks)

One:_____

_____

_____

Two:_____

_____

_____

b) The analyst suggested that the manual form doesn't allow for any data validation.
    Discuss the impact of data validation when gathering data.   (3 marks)

_____

_____

_____

_____

c) The receptionist has highlighted that they know how to use a spreadsheet. Explain why a
    database management system (DBMS) would be a better solution for the meeting room
    booking system.   (3 marks)

_____

_____

_____

_____

Question 20   **(27 marks)**

Below is a spreadsheet the receptionist at Kensington University stores about the bookings.
Use this to answer all parts of the question.

	A	B	C	D	E	F	G
1	RoomName	BuildingName	MaxSeats Available	Equipment	StaffFirstName	StaffSurname	StaffPhone
2	P101	Patten	10	Trestle table	Billy	Somers	0431297077
3	C303	Cromwell	30	Laptop and data projector	Danielle	Palermo	0431215979
4	W121	Wellesley	12	Coffee cups and spoons	Alice	Strait	0431257981
5	J151	Jenkin	15		Alice	Straite	0431257981
6	J151	Jenkins	15	Data projector	Mattie	Crow	0431262969
7	P101	Patten	10		Bernice	Harden	0431269307
8	W121	Welesley	12	Video and TV	Lawrence	Cloyd	0431206690
9	W121	Wellesley	12	TV	Shelley	Falkner	0431250889
10	P101	Patten	10	Data Projector	Lawrence	Cloyd	0431206690
11	C303	Cromwell	30		Billy	Somers	0431297077
12	P101	Patten	10	Coffee cups and spoons	Alan	Calder	0431237830
13	W121	Welesley	12		Michelle	Patterson	0431282348
14	W121	Wellesley	12	Trestle table	Melinda	Favela	0431283472
15	C303	Cromwell	30	Data Projector	Shelley	Falkner	0431250889

a) Explain the concept of data integrity using an example from the table.   (4 marks)

Data integrity:_____

_____

_____

_____

_____

Example:_____

_____

_____

_____

See next page

b) The data in the equipment column does not appear to be atomic. Explain the term using an example from the table and state what could be done to rectify the issue in the new system?
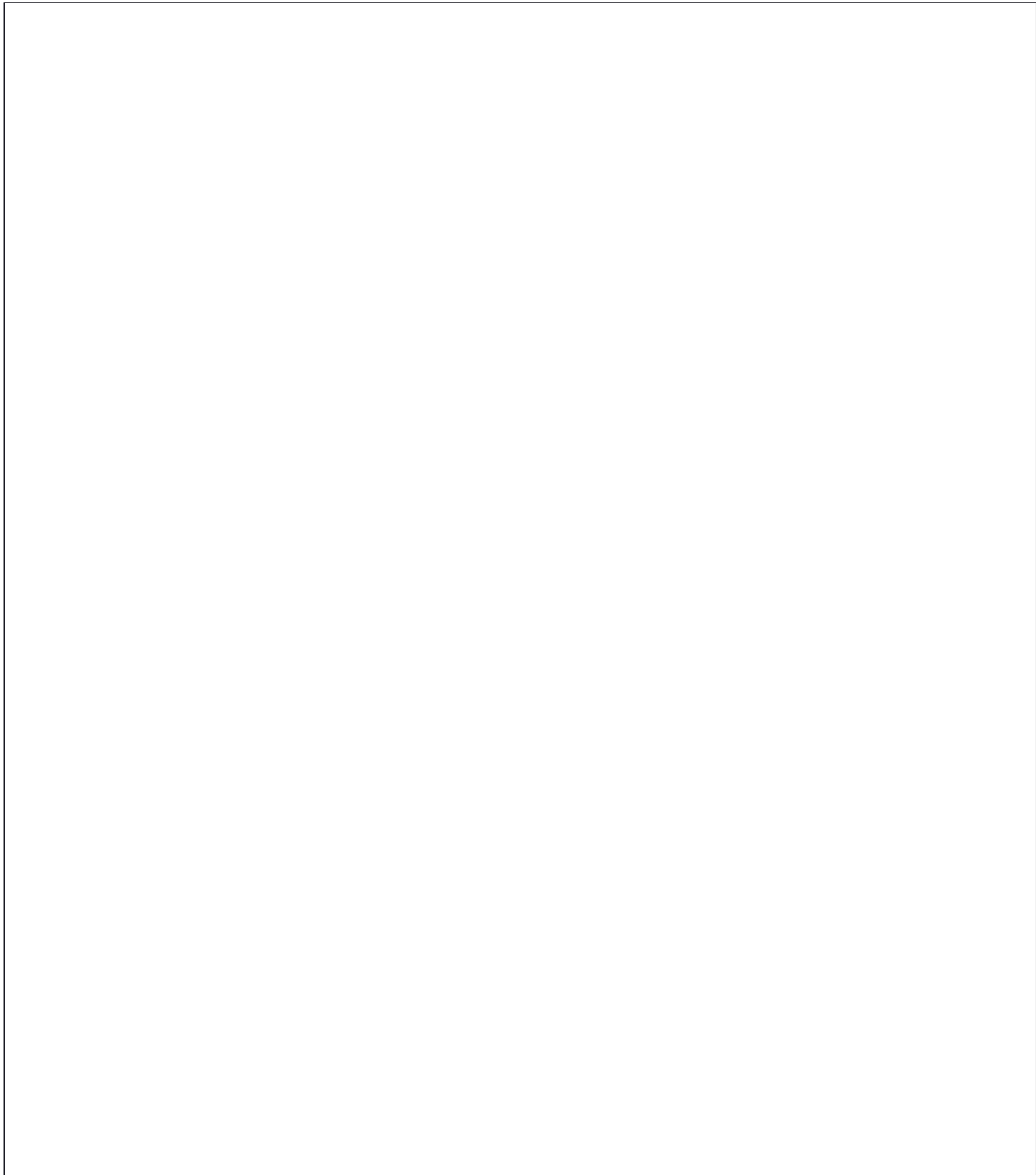
(5 marks)

Definition:_____

_____

_____

_____

Example:_____

_____

_____

How to rectify:_____

_____

_____

_____

c) Complete the Entity Relationship (ER) Diagram for this database in the area below using Chen's notation. Ensure you resolve all many to many relationships. Include Primary keys, Foreign keys, cardinality and relationships. You do not need to include non-key fields.   (19 marks)

- Staff can book many rooms and each room can be booked by many staff
- Equipment can be arranged for each room booking. Each booking can have many types of equipment. Each piece of equipment can be used on many different room bookings.

Question 21   **(21 marks)**

a) The receptionist has been complaining that her monitor flickers from time to time. Outline the steps you would take to diagnose and fix the fault.   (4 marks)

Diagnose:_____

_____

_____

Fix:_____

_____

_____

When you inspect the receptionist's desktop computer you see that she is running Windows 7 with Microsoft Office 2000. Her specifications are listed in the table below.

Product components	System Specifications
CPU	Intel® Pentium 3™, 1GHz
RAM	512MB, SDRAM, 100MHz
Hard Drive	80GB HDD
Graphics Card	NVIDIA® GeForce® 256
Monitor	17'' CRT
Operating System	Windows 7

Windows 10 Pro Minimum System Requirements:
1 GB of RAM and 16GB of storage

Office 365 Minimum System Requirements:
1.6GHz processor or faster with at least 2GB of RAM and 4GB of storage

b) The new system will be running Windows 10 Pro with Office 365. Explain why her old desktop computer will no longer be appropriate for running the new system.

(3 marks)

_____

_____

_____

_____

See next page

_____

c) The receptionist has had the same password for over 5 years, and she admits that it is just the word "password". The new booking system has the ability to force strong passwords. Describe **two (2)** password rules would you suggest to make the system more secure.

(4 marks)

One:_____

_____

_____

Two:_____

_____

_____

d) To ensure the integrity of the data Kensington University stores on their staff and students, they have decided to implement the use of biometrics to provide full access to their primary database. Describe **two (2)** forms of biometrics that could be used in this situation.

(4 marks)

One:_____

_____

_____

_____

Two:_____

_____

_____

_____

See next page

e) Kensington University has decided to implement an SOE. Expand the acronym and describe the concept of SOE.

(3 marks)

SOE:_____

Description:_____

_____

_____

_____

_____

f) The receptionist needs a word processor on her home computer. A friend at work has given her a flash drive with Microsoft Office on it. Explain **one (1)** legal implications for her installing the software on her PC.   (3 marks)

_____

_____

_____

_____

_____

_____

_____

_____

END OF EXAMINATION

See next page

END OF EXAMINATION

Spare lined paper for long answers or corrections