COMPUTER SCIENCE ATAR Year 11
Unit 1 SAMPLE SEMESTER I EXAM PAPER

Student full Name: _____

Student Number:

Date of Examination _____

Teacher's Name: Ms Wana Radzi

Time allowed for this paper
Reading time before commencing work: 10 minutes
Working time for paper: 2.5 hours

Materials required/recommended for this paper
To be provided by the supervisor
This Question/Answer Booklet

To be provided by the candidate
Standard items: pens, pencils, eraser, correction fluid/tape, ruler, highlighters

Special items: non-programmable calculators satisfying the conditions set out by the School Curriculum and Standards Authority for this course

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 notes or other items of a non-personal nature in the examination room. 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 exam
Section One: Short Answer	17	17	70	**50**	45
Section Two: Extended answer	7	7	80	**60**	55
			Total	**110**	100

Instructions to Candidate

1. Answer the questions according to the following instructions.

   Section One and Two: Write your answers in this Question/Answer Booklet.

2. When calculating numerical answers, show your working or reasoning clearly unless instructed otherwise.

3. You must be careful to confine your responses to the specific questions asked and to follow any instructions that are specific to a particular question.

4. Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.
   - Planning: If you use the spare pages for planning, indicate this clearly at the top of page.
   - Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question(s) that you are continuing to answer at the top of the page.

SECTION ONE – SHORT ANSWER **(50 MARKS)**

Question 1. **(6 marks)**

Name each of the following devices, and state whether it is an input or output device.

Name	**Device Type**	**Name**	**Device Type**

Name	**Device Type**	**Name**	**Device Type**

Name	**Device Type**	**Name**	**Device Type**

Question 2.   **(4 marks)**
Draw a sketch of a computer system.

Question 3.   **(8 marks)**
Computer storage is broadly categorised as Primary and Secondary Storage. Identify the storage types for the following and identify the features of each in the storing of data.

SD card

Storage Type: _____

Features: _____

_____

_____

L3 Cache

Storage Type: _____

Features: _____

_____

_____

CMOS

Storage Type: _____

Features: _____

_____

_____

Solid state hard drive

Storage Type: _____

Features: _____

_____

_____

Question 4.   **(1 mark)**
Mike's hard drive is 500 MB in size, how many Gigabytes is this?

_____

_____

Question 5.   **(1 mark)**
Re-order these storage capacities from smallest to largest.
- gigabyte
- bit
- terabyte
- byte
- kilobyte
- megabyte

_____

Question 6.   **(2 marks)**
The Central Processing Unit (CPU) is made up of a number of components, which include the Control Unit, the Arithmetic Logic Unit and Registers. Define the type of memory (primary or secondary) **registers** are and describe the information that they hold.

Type of memory: _____

Information it holds: _____

_____

Question 7.   **(2 marks)**
Inside Emma's computer, dust has built up heavily around the processor fan. Her computer has begun to switch off suddenly when it has been on for a while. Explain why this is most likely happening

_____

_____

_____

Question 8.   **(4 marks)**

a. Information from the *TreeSaver* charity volunteers and employees is always recorded. A
    large foresting company has a court order to collect the information of protesters it knows
    are members of the *TreeSaver charity*. The volunteers and employees gave their
    information to *TreeSaver* in 'good faith'. Giving employee and volunteer information is not
    illegal because of the court order, but what ethical issue does this present for *TreeSaver.*

                                                                                  (2 marks)

_____

_____

_____

_____

_____

_____

b. *TreeSaver* has recently suffered an attack by hackers on its' computer system. *TreeSaver*
    fears that the personal data of employees and volunteers has been compromised in the
    attack. Describe 2 things *TreeSaver* now has to do.   (2 marks)

_____

_____

_____

_____

_____

_____

Question 9. **(3 marks)**

Describe what occurs in the following stages of the Systems Development Life Cycle (SDLC).

Analysis _____

_____

_____

_____

Development _____

_____

_____

Implementation: _____

_____

_____

Question 10. **(3 marks)**

In the diagram below, number the stages of the boot process from 1 to 7 in order (one has been done for you already).

Boot stage	Number
The power supply sends a signal to the components in the system unit.	
The operating system loads configuration information, may request user information (eg username and password), start several background processes and display the desktop on the screen.	
The BIOS may look for system files on a USB flash drive or CD or hard disk.	5
The system files and the kernel (core) of the operating system are loaded into memory (RAM) from secondary storage.	
The processor finds the ROM chip that contains the BIOS (basic input/output system).	
The BIOS performs the POST (power-on self test) which checks components such as the mouse, keyboard, and adapter cards.	
The results of the POST are compared with data in a CMOS (complementary metal oxide semiconductor) chip.	

Question 11.   **(2 marks)**

Newman College has many different computers with different operating systems and different applications installed.

Explain how creating a SOE would be beneficial for the school?

_____

_____

_____

Question 12.   **(4 marks)**
List the 4 steps that the central processing unit uses to perform each instruction.

_____

_____

_____

_____

_____

_____

Question 13.   **(2 marks)**
Biometrics uses unique identifiable attributes of people for identification, for example a person's finger print. What is an advantage of using biometrics for a business?

_____

_____

Question 14.   **(2 marks)**
Define data decryption

_____

_____

Question 15.   **(2 marks)**

Explain why public key encryption may be used instead of private key encryption when communicating over the internet?

_____

_____

Question 16.   **(2 marks)**

SDLC and Prototyping are two types of system development methodology used to structure, plan, and control the process of developing an information system. Which method would you prefer to use if you were developing a system and why?

_____

_____

_____

_____

_____

_____

Question 17.   **(2 marks)**

There are 4 steps involved to complete a project in project management. Choose 2 steps from the list below and write down one task involved during each of the steps.

PLAN, BUDGET, SCHEDULE, TRACK

_____

_____

_____

_____

_____

_____

SECTION TWO - EXTENDED ANSWERS   **[60 MARKS]**

Question 18.   **(15 marks)**

CountryID	CountryName	CountryAreaSqKm	Population	CapitalCity	Government	fContinentID	Flag
1	Zambia	753,000	10,000,000	Lusaka	Republic	1	Picture
2	Brazil	8,511,965	184,101,019	Brasilia	Federative republic	7	Picture
3	Australia	7,686,850	19,913,114	Canberra	Democratic, federal-state system	4	Picture
4	China	9,596,960	1,298,847,624	Beijing	Communist state	2	Picture
5	Canada	9,976,140	32,507,874	Ottawa	Confederation with parliamentary democracy	6	Picture
6	Norway	324,220	4,574,560	Oslo	Constitutional monarchy	5	Picture

a. Use the table shown above to determine the most appropriate data type for each of the following fields. (2 marks)

CountryID   _____   Population   _____

Government _____   Photo   _____

b. Use this diagram to answer the following questions. (4 marks)
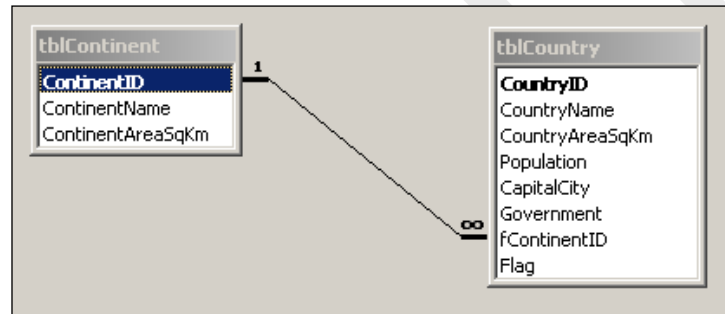
i.   Write the name of the table which is on the primary side of the relationship.

_____

ii.   Explain how you know which table is on the primary side and which table is on the related side.

_____

_____

iii.   Which table takes priority of data to be entered first, primary side or the related side? Why?

_____

_____

c. List the primary keys for the tables. (1 mark)

tblCountry   _____

tblContinent _____

d. Explain 2 purposes (or uses) of a form. (2 marks)

_____

_____

e. Explain the purpose of a report. (1 mark)

_____

_____

f. List <u>one</u> difference between a filter and a query? (1 mark)

_____

_____

Use the tables below to answer the following questions.

tblContinent : Table

	ContinentID	ContinentName	ContinentAreaSqKm
+	1	Africa	31,000,000
+	2	Asia	45,000,000
+	3	Antartica	13,000,000
+	4	Australia	8,000,000
+	5	Europe	10,000,000
+	6	North America	24,000,000
+	7	South America	18,000,000

tblCountry : Table

CountryID	CountryName	CountryAreaSqKm	Population	CapitalCity	Government	fContinentID	Flag
1	Zambia	753,000	10,000,000	Lusaka	Republic	1	Picture
2	Brazil	8,511,965	184,101,019	Brasilia	Federative republic	7	Picture
3	Australia	7,686,850	19,913,114	Canberra	Democratic, federal-state system	4	Picture
4	China	9,596,960	1,298,847,624	Beijing	Communist state	2	Picture
5	Canada	9,976,140	32,507,874	Ottawa	Confederation with parliamentary democracy	6	Picture
6	Norway	324,220	4,574,560	Oslo	Constitutional monarchy	5	Picture

g. Write the name of the foreign key field. (1 mark)

_____

h. What is the purpose of a foreign key? (1 mark)

_____

_____

i. Explain what will happen if you try and add the following data to the Country table. Make sure you use the previous tables to help you with your explanation.   (2 marks)

CountryID	CountryN ame	CountryAreaSqK m	Population	Capital City	Government	FContinentID	Flag
7	New Zealand	268,680	4,239,300	Welling ton	Parliamentary democracy	9	Picture

_____

_____

Question 19.   **(16 marks)**

Windy West Car Hire is a small business whose owners want to improve its efficiency and they have contacted you to analyse how their system operates.

a. The Windy West Car Hire owners have been told they need to use a System Development Life Cycle (SDLC) to create their new system. You have been given the six stages but they have been scrambled. Place them in order by using the numbers 1–6

(3 marks)

Stage Name	Order number
Design	
Evaluation and maintenance	
Preliminary analysis	
Implementation	
Analysis	
Development	

The following description describes how vehicles are hired out in the current system:

When a customer wishes to hire a vehicle, they go online to the business's website and search the vehicle database for availability of the type of car they want to hire. The customer makes a note of the car ID and then contacts the office.

The receptionist records the hire details by:
- Getting from the customer;
    - customer's name, home address, driver's license number and credit card details
    - the car ID and the length of time they wish to hire it for.
- entering the customer's details into the customer database and getting a customer ID from the database.
- The customer ID and car ID are entered into the hiring file.

The receptionist calculates the cost of the hire by
- Using the carID to get the car type and rate from the vehicle database
- Multiplying the car rate with the length of hire

She tells the customer the total cost of the hire then uses the customer's credit card details to make an electronic transaction for the full hire amount via the EFTPOS machine to the bank. The bank receipt number is then entered into the hiring file.

(b)   List two entities referred to in the description.   (2 marks)

_____

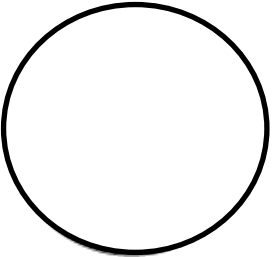(c)   List two data stores referred to in the description.   (2 marks)

_____

(d)   List two processes referred to in the description.   (2 marks)

_____

(e)   List two data flows referred to in the description.   (2 marks)

_____

_____

(f)   Windy West Car Hire has been presented with the following partially completed Level 0 Data Flow Diagram (DFD). Complete the data flow diagram. (5 marks)
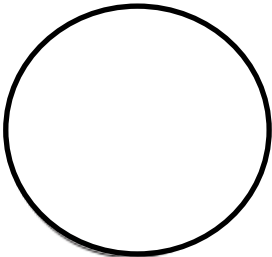
Question 20.   **(8 marks)**

The data below is part of the hiring datastore that is kept on a spreadsheet by Windy West Car Hire. The following notes describe the process.

When the vehicle is hired, the hirer's first name, the car type, the number of days for which it is initially hired and the number of kilometres on the odometer at the start of the hire are entered into the spread sheet.

- A VLookup function uses the car type to return a value for hire cost per day, which is used to calculate the total cost for basic car hire.

When the car is returned the following actions occurs:

- the final kilometre reading is entered into the spread sheet
- the total kilometres travelled is calculated
- A VLookup function returns the car type cost per day
- A formula is used to calculate the total hire cost. Worked examples have been provided

	A	B	C	D	E	F	G	H	I	J	K
1	Hirer	Car type	Days hired	Car type hire cost per day ($)	Total cost for basic car hire ($)	Start kilometres	Final kilometres	Total kilometres travelled	Car type cost per kilometre	Total kilometre cost ($)	Total hire cost ($)
2	Harold	sedan	3	35.00	105.00	12900	13201	301	1.00	301.00	406.00
3	Ahmed	wagon	1	40.00	40.00	21909	22309	400	1.25	500.00	540.00
4	Greg	people mover	4	65.00	260.00	15191	15775	584	2.25	1314.00	1574.00
5	Khang	ute	2	37.50	75.00	8321	8707	386	3.25	1254.50	1329.50
6	Ben	wagon	2	40.00	80.00	2235	2572	337	1.25	421.25	501.25
7	Jill	sedan	1	35.00	35.00	25009	25336	327	1.00	327.00	362.00
8											
9											
10		Per Day Cost									
11		Car type	Car hire cost per day ($)								
12		sedan	35.00								
13		wagon	40.00								
14		people mover	65.00								
15		ute	37.50								
16											
17											

The following formulas need to be supplied.
(Do not attempt to calculate any answers, as only the formulas are required.)

a) Write the formula for Cell H2 that calculates the total kilometres travelled.   (1 mark)

_____

b) Write the formula for Cell E2 that calculates the total cost for basic car hire.   (1 mark)

_____

c) Complete the VLookUp function below to calculate the car type cost per day value into
    Cell D2.   (2 marks)

    =VLookUp (

d) In spread sheets, what does a formula always start with?   (1 mark)

_____

Windy West Car Hire wants to convert its spreadsheet into a database. Part of the change
requires that all data types match between the two systems.

e) Explain the term data type.   (1 mark)

_____

_____

f) What data type is being used in Cell A2?   (1 mark)

_____

g) What data type is being used in Cell F2?   (1 mark)

_____

Question 21.   **(6 marks)**

Angler-PK ▾	AName ▾	Aphone ▾	AAddress ▾	DDOB ▾
⊞ 1	John	(08)93770666	10 William St Canning	1/01/1988
⊞ 2	James	(08)93770777	10 Bentley Dr Bentley	11/11/2000
⊞ 3	Will	(08)62776666	42b Reid Prom Perth	22/03/1999

Diagram 1

a. Refer to Diagram 1 (shown above) to determine the best data type for each of these
    fields.   (4 marks)

Angler-PK: _____

APhone:_____

AName: _____

ADOB: _____

b. Use examples from Diagrams 1 and 2 to help explain the following database terms:
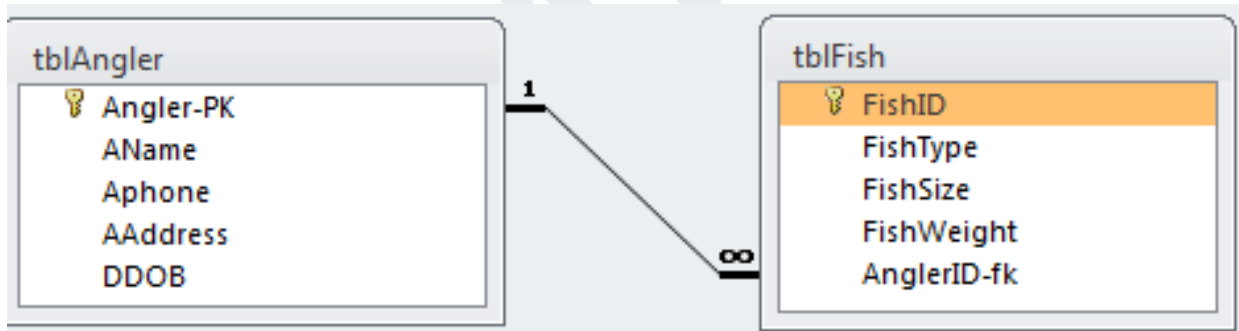   (2 marks)

tblAngler
  🔑 Angler-PK
     AName
     Aphone
     AAddress
     DDOB

tblFish
  🔑 FishID
     FishType
     FishSize
     FishWeight
     AnglerID-fk

1 ———— ∞

Diagram 2

Record _____

_____

_____

_____

Relationship _____

_____

_____

_____
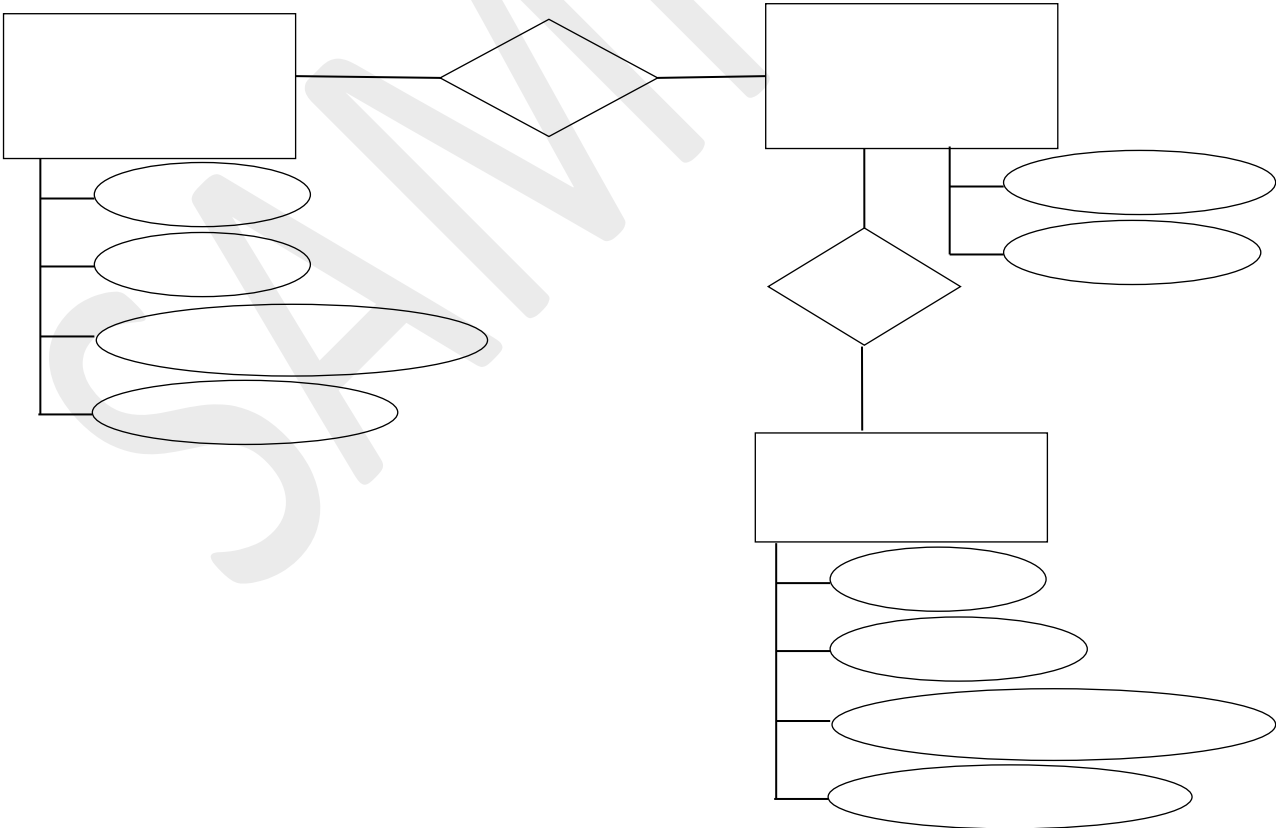
Question 22.   **(8 marks)**

Draw the Entity Relationship Diagram (ERD) to show the relationships between a student borrowing books from the library. (A student can borrow many books and a book and be borrowed by many students.

Resolve the M:N relationahip. Relationship

a.   **Cardinality** – Relationship type
b.   Underline all the primary keys including one primary **composite key**

End of Section 2

END OF EXAM