Semester 2 2021

ATAR course examination

Question/Answer booklet

**Year 11 ATAR COMPUTER SCIENCE MARKING KEY AECSC**

Surname:

Other names:

WA student number (if known)

SIDE Teacher:

SIDE Student Coordinator:

**Supervisor’s declaration**

I declare that this examination paper has been completed by the student named above. The time and resource restrictions have been observed and the student has NOT accessed notes, texts, reference books, the internet, a computer, a calculator or a mobile phone unless otherwise specified. I understand that breaches of the examination rules could lead to an examination paper being cancelled or having an examination mark significantly lowered.

Supervisor’s name:

Signature: Date:

**Time allowed for this paper**

Reading time before commencing work: ten minutes

Working time: three 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 (blue/black preferred), pencils (including coloured), sharpener, correction fluid/tape, eraser, ruler, highlighters

Special items: up to three calculators, which do not have the capacity to create or store programmes or text, are permitted in this ATAR course 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 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 | 20 | 20 | 60 | 101 | 40 |
| Section Two:  Extended answer | 5 | 5 | 90 | 101 | 60 |
|  |  |  |  | **Total** | 100 |

**Instructions to candidates**

1. The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2021*. 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 ballpoint or ink 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 responses 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. 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 the 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 1: Short Answer 40%(101 Marks)**

This section contains **20** questions. You must answer **all** questions. Write your answers in the spaces provided.

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 to answer.

* Planning: If you use the spare pages for planning, indicate this clearly at the top of the 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 that you are continuing to answer at the top of the page.

Suggested working time: 70 minutes.

**Question 1 (2 marks)**

Describe the purpose of a Level 0 Data Flow Diagram.

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Describes fully the purpose of a Level 0 Data Flow Diagram | 2 |
| Stated purpose. Little attempt to describe | 1 |
| **Possible Answer**  A Level 0 Data Flow Diagrams purpose is to show visually how data flows through a system by providing the detail of processes applied to the data into something the organisation can use and then to show how this processed data is stored. |  |

**Question 2 (3 marks)**

Explain one key difference between non-procedural languages and object-oriented languages.

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Explains fully and correctly a key difference | 3 |
| Identifies a correct difference | 2 |
| Partially correctstatement only. | 1 |
| **Possible Answer**  Non procedural language is function driven where the functions, mathematical or scientific, are created to be mostly independent of each other and re-usable on data that is fixed in the form of variables. Object Oriented language does not deal with variables and functions, it deals with objects and classes. Data in OOP is mutable rather than immutable which is characteristic of functional or non-procedural language. |  |

**Question 3 (2 marks)**

Describe how a digital signature protects data.

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Fully explains how a digital signature protects data identifying the two keys . | 2 |
| Statement only identifying public/private keys | 1 |
| **Possible Answer**  When sending data over a non-secure channel, a Digital signature uses a private key to lock or encrypt the data. The receiver must have the public key to unlock the data. Digital signatures are obtained by Certifying Authorities. |  |

**Question 4 (3 marks)**

Discuss the term ‘hierarchical structure of data’ referring to relational databases.

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Discusses fully the hierarchical structure in relational databases referring to tables, records, fields, character in the correct order | 3 |
| Discusses the hierarchical structure in relational databases will get most in correct order | 2 |
| Statement only with few in correct order | 1 |
| **Possible Answer**  In a relational database, the hierarchy of data refers to items from their largest to their smallest and visa versa. Each larger item contains a number from the next largest item. For instance, a table contains records, a record has fields and the fields contain characters of a datatype |  |

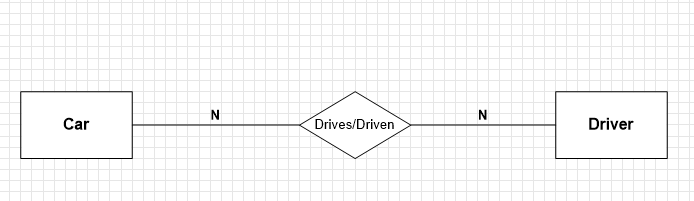
**Question 5 (2 marks)**

What is meant by the term atomicity in relation to databases?

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Describes atomicity fully in relation to databases | 2 |
| Statement only. Little attempt to describe | 1 |
| **Possible Answer**  Atomicity in relation to databases refers to a field containing the most succinct data in a useful form. For instance an address that contains a postcode is not atomic as the postcode is a usable search item and should be in it’s own field |  |

**Question 6 (6 marks)**

Examine the following diagram



1. Explain why this ERD will cause issues within a database if it is left unresolved.

(3 marks)

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Explains fully why having a many to many relationship will create issues within the database by illustrating with specific impact | 3 |
| Explains generally why issues will be created | 2 |
| Limited explanation | 1 |
| **Possible Answer**  Having an unresolved many to many relationship breaks the rule of 1 within a database ie, 1 primary key, 1 record. In this instance, there will be more than one instance of a car and a driver occurring at the same time so the record is not unique, it is replicated multiple times as each car could be driven by every driver and every driver can drive every car. |  |

1. Discuss how this ERD would be resolved. (3 marks)

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Discusses fully how the relationship is resolved referring to data | 3 |
| Discusses generally how the relationship is resolved | 2 |
| Limited statement/discussion | 1 |
| **Possible Answer**  The many to many relationship is resolved by creating an intermediary table. This allows the rule of one to be enforced as each instance of a particular car being driven by a particular driver becomes a unique record. In this case a concatenated key may not uniquely identify the record so a different/automatic key should be used. |  |

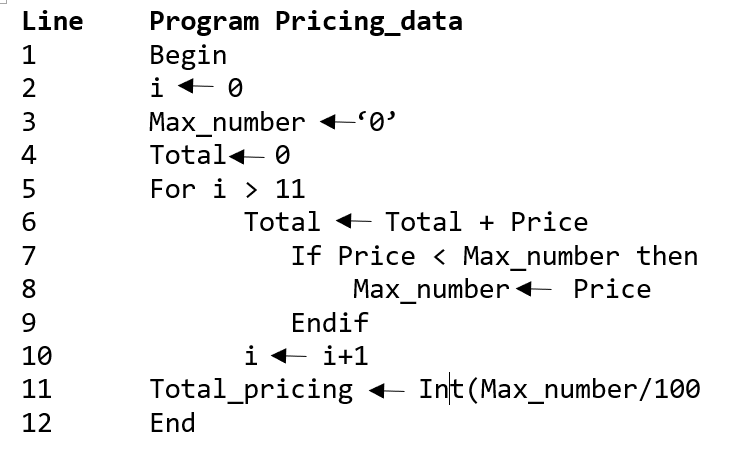
**Question 7 (2 marks)**

Discuss how relationships are established in a Relational Database Management System. You may draw a diagram to assist.

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Discusses how relationships are established in a RDBMS | 2 |
| Partial discussion or statement only | 1 |
| **Possible Answer**  To establish a relationship a tables (say Table A)s primary key becomes a foreign key in another table (Table B) when Table A has a relationship with Table B. This allows a user to query the data through these linkages and negates the need to store the fields of the records in Table A in Table B. |  |

**Question 8 (9 marks)**

This question relates to the following code snippet.



Using an example from the code, explain what happens when the following errors occur.

1. Run-time:

Example:

Explanation:

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Provides correct Run-time example: | 1 |
| Provides full explanation | 2 |
| Limited explanation | 1 |
| **Possible Answer**  Example: Line 3 or 7  Explanation: Incorrect data type or something is missing. In this case the symbol is around the wrong way and may confuse the running. The program will crash. The data type ‘0’ may also cause the program to crash |  |

1. Syntax:

Example:

Explanation:

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Provides correct Syntax example | 1 |
| Provides full explanation | 2 |
| Limited explanation | 1 |
| **Possible Answer**  Example; line 11 – bracket missing  Explanation: the program will not run as it will not compile. If a keyword is misspelt. In this instance a bracket is missing so this will not make sense and the program will not compile with this sort of error |  |

1. Logic:

Example:

Explanation:

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Provides correct Logic example | 1 |
| Provides full explanation | 2 |
| Limited explanation | 1 |
| **Possible Answer**  Example: Line 5 or 7  Explanation: When the program produced a result that is unexpected. In this case, Line 5 and line 7 it looks like the symbol is around the wrong way. The programmer maybe didn’t understand the problem or just forgot when way to turn the symbol |  |

**Question 9 (9 marks)**

Describe the purpose of the following and explain their impact on system performance:

1. Central Processing Unit:

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Provides description of the purpose and the impact on system performance | 3 |
| Describes either impact or purpose | 2 |
| Limited description | 1 |
| **Possible Answer**  The Central processing unit is knows as the ‘brains’ of a system as it processes all inputted instructions. How fast it can process these instructions determines how fast the system can go in terms of number of instructions per second. For example a multicore CPU will be able to process more instructions simultaneously than a single core and the user may notice less lap with a multi core |  |

1. Bus:

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Provides description of the purpose and the impact on system performance | 3 |
| Describes either impact or purpose | 2 |
| Limited description | 1 |
| **Possible Answer**  The bus acts as the main electronic transportation highway for data, addresses and control signals and communication with the CPU. For instance, the data bus connects RAM to the CPU and how much data it can transfer will impact system performance. If a high performing CPU is connected to RAM with a bus that does not transfer the data quickly enough to keep up with the rate the CPU can process it, the system will be underperforming. |  |

1. System clock:

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Provides description of the purpose and the impact on system performance | 3 |
| Describes either impact or purpose | 2 |
| Limited description | 1 |
| **Possible Answer**  The system clock is a small circuit that provides a continuous pulse that determines the speed with which a device can go. The CPU’s instruction speed is determined by the rate of the system clock and how many instructions it can process per tick of that clock. Overclocking is setting the pulse higher than factory settings and whilst it makes the system faster because it forces the CPU to process instructions faster, it also will generate heat that may damage the unit. |  |

**Question 10 (9 marks)**

Tick the boxes (there can be more than one) that are relevant to the following memory type

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **ROM** | **RAM** | **Cache** |
| Stores the start-up process | x |  |  |
| Read-only | x |  |  |
| Stores frequently used instructions |  |  | x |
| Located on or beside CPU |  |  | x |
| Volatile |  | x | x |
| Read-write |  | x | x |
| Non-volatile | x |  |  |

**Question 11 (6 marks)**

What are the stages of the System Development Life Cycle?

1 mark each

* Preliminary
* Analysis
* Design
* Development
* Implementation
* Maintenance and evaluation

**Question 12 (5 marks)**

Discuss the advantages and disadvantages of creating a computer network within a small to medium sized business.

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Discusses 2 advantages and 2 disadvantages of a network specific to a small to medium sized business (or 3 advantages and 1 disadvantage) | 5 |
| Discusses 2 advantages and 1 disadvantage in relation to SMO (or 2 disadvantages and 1 advantage) | 4 |
| Discusses a disadvantage and an advantage in relation to an SMO | 3 |
| Discusses an advantage and disadvantage – no linkage to SMO | 2 |
| Stages an advantage or a disadvantage. | 1 |
| **Possible Answer**  Installing a network might be expensive if the small/medium sized business is in an old building that requires re-wiring. The initial purchase of routers and switches might be too expensive. However the advantages would include improved communication and sharing of resources including access to the internet from all devices if set up as wireless and wired combination. A disadvantage would be the likely requirement for a trained administrator but an advantage would be the ability to push out software and establish an SOE. |  |

**Question 13 (10 marks)**

A game is played as follows:

* Two dice are thrown one red and the other blue.
* If the dice are the same value – a score of 0 is recorded and the game ends
* If they are not the same value the score = score + red value – blue value. After this process, if the score is less than 0 then the score becomes 0 then the game ends.
* Otherwise the score is stored for the next round and the dice get thrown again.

1. Create a flowchart for the above program below. (7 marks)

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Correct start/end | 1 |
| Correct input | 1 |
| Correct processes | 2 |
| Correct decisions | 1 |
| Loop | 1 |
| **Possible Answer** |  |

1. Using this flowchart, complete the score column for the first roll in the table below. (3 marks)

|  |  |  |
| --- | --- | --- |
| **Red Dice** | **Blue Dice** | **Score** |
| 4 | 4 | 0 |
| 2 | 6 | 0 |
| 6 | 3 | 3 |

**Question 14 (5 marks)**

1. Identify the values indicated by the letters A – E.

|  |  |
| --- | --- |
| ***A*** bits | 1 Kilobyte |
| ***B*** Kilobytes | 24, 576 bits |
| ***C*** Kilobytes | 8,192 Bytes |
| ***D*** Kilobytes | 2 Megabytes |
| ***E*** bits | 2 Bytes |

A:1024

B:3

C:8

D: 2000

E:16

**Question 15 (3 marks)**

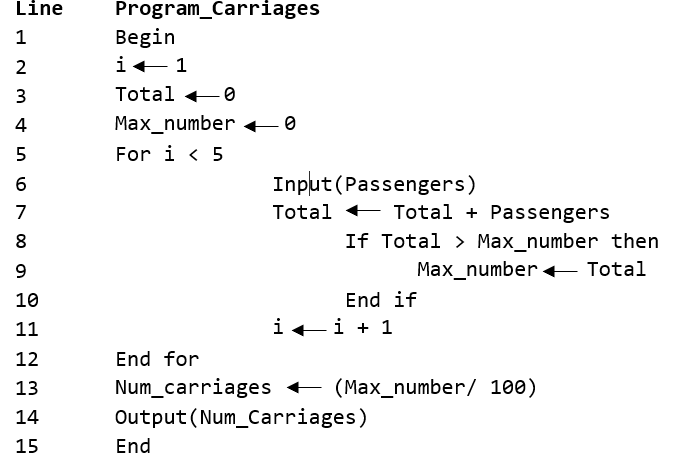
Convert the following

1. 10110111 into hexadecimal:B7 183
2. Hexadecimal DE into binary: 11011110
3. Decimal 124 into Hexadecimal: 7C

**Question 16 (12 marks)**

Consider the following code.

Complete the trace table that follows for the four Passengers inputs 150, 100, 50, -100



|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Description** | | | | | | | **Mark** | |
| First pass (i correct, total and Max no) | | | | | | | 3 | |
| Second pass (i correct, total and max no) | | | | | | | 3 | |
| Third pass (i correct, total and max no) | | | | | | | 3 | |
| Fourth Pass with correct output (total, max no, carriages) | | | | | | | 3 | |
| **Possible Answer** | | | | | | |  | |
| **Line** | **i** | **i < 5** | **Passengers** | **Total** | **Max\_number** | **Num\_carriages** | | **Output** |
| 2 | 1 |  |  |  |  |  | |  |
| 3 |  |  |  | 0 |  |  | |  |
| 4 |  |  |  |  | 0 |  | |  |
| 5 |  | y |  |  |  |  | |  |
| 6 |  |  | 150 |  |  |  | |  |
| 7 |  |  |  | 150 |  |  | |  |
| 9 |  |  |  |  | 150 |  | |  |
| 11 | 2 |  |  |  |  |  | |  |
| 5 |  | y |  |  |  |  | |  |
| 6 |  |  | 100 |  |  |  | |  |
| 7 |  |  |  | 250 |  |  | |  |
| 9 |  |  |  |  | 250 |  | |  |
| 11 | 3 |  |  |  |  |  | |  |
| 5 |  | Y |  |  |  |  | |  |
| 6 |  |  | 50 |  |  |  | |  |
| 7 |  |  |  | 300 |  |  | |  |
| 9 |  |  |  |  | 300 |  | |  |
| 11 | 4 |  |  |  |  |  | |  |
| 5 |  | Y |  |  |  |  | |  |
| 6 |  |  | -100 |  |  |  | |  |
| 7 |  |  |  | 200 |  |  | |  |
| 9 |  |  |  |  | 300 |  | |  |
| 11 | 5 |  |  |  |  |  | |  |
| 5 |  | n |  |  |  |  | |  |
| 13 |  |  |  |  |  | 3 | |  |
| 14 |  |  |  |  |  |  | | 3 |

**Question 17 (2 marks)**

Discuss the difference between a client/server network and peer to peer network.

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Discusses the difference | 2 |
| Identifies a difference. | 1 |
| **Possible Answer**  A client server network differentiates between the clients and a server where the data is stored. In a peer to peer, there is no differentiation between and each peer stores it’s own data. |  |

**Question 18 (6 marks)**

Discuss the function of the following devices within a Wider Area Network.

Bridge:

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Discusses the function in relation to a wider area network identifying connection of networks using same protocol | 2 |
| States function no reference to wider area network. | 1 |
| **Possible Answer**  A bridge can connect LANs using the same protocol to create a network over a larger geographical area or WAN. |  |

Switch:

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Discusses the function in relation to a wider area network | 2 |
| States function no reference to wider area network. | 1 |
| **Possible Answer**  A switch creates a Local Area Network. Connecting multiple local area networks can create a network over a larger geographical area or WAN. A switch breaks down a WAN into smaller subnets. |  |

Router:

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Discusses the function in relation to a wider area network and | 2 |
| States function no reference to wider area network. | 1 |
| **Possible Answer**  A router is used to forward packets along to the intended IP address. A router also connects networks together and connects them to the wider area network or internet |  |

**Question 19 (3 marks)**

Referring to an example, discuss why a protocol is required within a network.

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Refers to a specific example, discusses why this protocol is required within the network | 3 |
| Identifies a protocol and states use in network | 2 |
| Mentions a protocol or makes a generalised statement | 1 |
| **Possible Answer**  The Internet Protocol is very important within a network. It establishes the address of where a packet of data comes from and where it is to go to. When combined with the Transmission Control Protocol it forms the backbone of most networks and the internet. |  |

**Question 20 (2 marks)**

Identify an advantage and a disadvantage of using a star topology.

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Identifies both an advantage and disadvantage of star topology | 2 |
| Identifies either an advantage or a disadvantage | 1 |
| **Possible Answer**  A star topology provides a robust network in that if a computer that is not the central node, it will still work. However if the central node fails, the network goes down. In most circumstances the central node is a switch to create the LAN. |  |

**End of Section One**

**Section Two: Extended answer 60% (101 Marks)**

This section has **five (5)** questions. Answer **all** questions. Write your answers in the spaces provided.

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 to answer.

* Planning: If you use the spare pages for planning, indicate this clearly at the top of the 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 that you are continuing to answer at the top of the page.

Suggested working time: 110 minutes.

Questions 21 through to 25 refer to the Source Booklet

**Question 21 (16 marks)**

Refer to figures 1 and 2 on page 2 relate to Wesley’s spreadsheet.

1. Refer to Figure 1 and complete this table by identifying the formula contained in the cells listed. (8 marks)

|  |  |
| --- | --- |
| **Cell** | **Formula** |
| B6 | =SUM(B2:B5) Correct function (1 mark), correct range (1 mark) |
| B7 | =AVERAGE(B2:B5) Correct function (1 mark), correct range (1 mark) |
| B8 | =MIN(B2:B5) Correct function (1 mark), correct range (1 mark) |
| B9 | =MAX(B2:B5) Correct function (1 mark), correct range (1 mark) |

1. Identify one advantage and one disadvantage associated with using a spreadsheet to store the business’s data. (2 marks)

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Identifies both an advantage and disadvantage | 2 |
| Identifies either an advantage or a disadvantage | 1 |
| **Possible Answer**  An advantage of using a spreadsheet is that it is easier to set up and allows for What If analysis to occur. A disadvantage is that there is a lot of duplicated data and this would cause problems in terms of data integrity |  |

1. As part of the System Development, Wesley is considering replacing his spreadsheets with a Relational Database Management System. Discuss the advantages and disadvantages of such a system. (2 marks)

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Identifies both an advantage and disadvantage of and RDBMS | 2 |
| Identifies either an advantage or a disadvantage | 1 |
| **Possible Answer**  An RDBMS will allow a user to query the data and develop reports that help make decisions. It will also reduce duplication and if set up correctly it will improve the quality of information it provides over a spreadsheet. However, it is more complex to setup than a spreadsheet and will require experience/training to use it. |  |

**Question 22 (12 marks)**

1. At which stage of the System Development Life Cycle would a Context Diagram be drawn. (2 marks)

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Identifies both design and develop | 2 |
| Identifies either design or develop | 1 |
|  |  |

1. Refer to the information provided on page 1 of your Source Booklet, create the Context Diagram below. (12 marks)

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Customer Entity  Data flows x 4 | 1 mark  4 marks |
| Suppliers Entity  Data flows x | 1 mark  4 marks |
| System identified | 1 mark |
| **Possible Answer** |  |

**Question 23 (28 marks)**

1. Create the Level 0 Data Flow Diagram Below

The till is to be considered a store in this system.

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Process 1.0 Order  Data flows | 1 mark  3 marks |
| Process 2.0 Report  Data flows | 1 mark  2 marks |
| Process 3.0 Takings  Data flows  Store | 1 mark  2 marks  1 mark |
| Process 4.0 Order supplies  Data flows  Store | 1 mark  3 marks  1 mark |
| Process 5.0 Check invoice  Data flows | 1 mark  2 marks |
| Process 6.0 Pay Supplier  Data flows  store | 1 mark  2 marks  1 mark |
|  |  |
|  |  |
| **Possible Answer** |  |

1. What part of the Level 0 Data Flow Diagram is represented in an Entity Relationship Diagram? (1 mark)

Store (1 mark)

1. Wesley is considering creating an order system for his larger business clients. This will require them to place a formal order and be invoiced once a month.

Describe how this change will impact both the Context Diagram and the Level 0 Data Flow Diagram. (4 marks)

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Describes full the changes impact on both Context and DFD | 4 |
| Describes the impact of change on both Context and DFD | 3 |
| Describes impact on either context or DFD | 2 |
| States an impact | 1 |
| **Possible Answer**  In the context diagram, this change may mean that another entity Business Customers, is required as the data flows are different into and out of the system when compared to Customers. In the DFD, some extra processes and a store would need to be introduced. A process that approves the Business Customer and stores their details in a store would be needed for the invoicing required at the end of the month. |  |

**Question 24 (35 marks)**

Whilst the system was being designed, Wesley’s business customers began buying a lot of his bread and pastry/cake products. It has become clear a database is required.

The Analyst has observed the following.

* All his business customers can place many orders.
* An order will contain many products
* Each product has its own unique recipe
* A recipe contains many ingredients
* Each ingredient is supplied by only one supplier
* A supplier can supply several ingredients.

1. Create an Entity Relationship Diagram based on the above business rules below. (26 marks)

You will need to show all relationships, cardinality and develop sensible primary keys for each table.

|  |  |
| --- | --- |
| **Description** | **Mark** |
| All entities identified | 6 marks |
| All primary keys | 6 marks |
| All foreign keys identified | 4 marks |
| Cardinality identified | 5 marks |
| Relationships correct and identified | 5 marks |
| **Possible Answer**    I went with this marking key but it should actually be many to many between product and order and thus need a joining table between them and same with recipe and ingredients |  |

1. The Analyst has suggested that database become an online one. The business customers access a form within the database to place their orders by midday the day before they require their product. This would allow Wesley enough time to order the ingredients for baking the next morning.

1. Wesley’s recipes are a trade secret and he has raised concerns about the security of this data online. Discuss the security threats associated with putting this database online. (5 marks)

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Full discussion of 3 security threats in relation to Wesley’s data | 5 |
| Full discussion of 2 security threats in relation to Wesley’s data | 4 |
| Full discussion of a security threat in relation to Wesley’s data | 3 |
| Discussion of a security threat | 2 |
| States a threat | 1 |
| **Possible Answer**  As soon as Wesley’s database goes online, there is the security threat associated with hackers trying to access his data and viruses being introduced to the network. In addition, if the database itself is not secure and accessible, then staff may access data the sensitive data stored. Given his baked items are his own recipes and provide a competitive advantage, a loss or theft of these recipes could be disastrous |  |

1. Identify and discuss two strategies Wesley could use to minimise the risk of his data being stolen. (4 marks)

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Identifies and discusses two strategies in relation to the threats listed above | 4 |
| Identifies 2 but discusses one in relation to threats above. | 3 |
| Identifies and discusses a strategy in relation to a threat above | 2 |
| Identifies a strategy -no discussion | 1 |
| **Possible Answer**  To minimise the threat associated with connecting to the internet, Wesley could install a firewall. This would block data packets from known troublesome IP addresses that pose either a viral or hacking threat. He could also ensure he installed an anti-virus software. To protect unauthorised access to the sensitive data stored in the database, Luke could encrypt it and minimise access by username and password. |  |

**Question 25 (10 marks)**

In the lead up to Christmas, Wesley is running a promotion for his daily customers who buy coffees. They will receive a free coffee for every 9 that they purchase (so 10th one free)

When his customers sign up for the promotion they will get a plastic identity card that they will present each time they purchase. Their card will be swiped on the till and updated with the coffee purchases they make. When the customer orders their 9th drink, there will be a prompt to advise the customer and the till operator that the next drink is free.

Write a program that will record the number of drinks bought and output “Next coffee free” after they have bought 9.

The Total variable must reset after the 10th coffee is served.

The first lines are written for you and you must use a loop.

**Program: Free\_Coffee**

Var Total, CurrentPurch: INT

Begin

Output(“How many drinks bought?”)

Read(CurrentPurch)

|  |  |
| --- | --- |
| **Description** | **Mark** |
| loop initiated and ended | 2 |
| < 10 | 1 |
| Total Total + CurrentPurch | 3 |
| Output | 2 |
| End program | 1 |
| **Possible Answer**  For CurrentPurch  Total Total + 1  If Total = 9  Output(“Next Coffee Free”)  If Total =10  Output(This Coffee is Free”)  Total = 0  End For  End |  |

End of Examination Questions

Question No

Question No

Question No

|  |  |
| --- | --- |
| **Line** | **Program\_Carriages** |
| 1 | Begin |
| 2 | i 1 |
| 3 | Total 0 |
| 4 | Max\_number 0 |
| 5 | For i < 5 |
| 6 | Input(Passengers) |
| 7 | Total Total + Passengers |
| 8 | If Total > Max\_number then |
| 9 | Max\_number Total |
| 10 | End if |
| 11 | i i + 1 |
| 12 | End for |
| 13 | Num\_carriages (Max\_number/ 100) |
| 14 | Output(Num\_Carriages) |
| 15 | End |