



COMPUTER SCIENCE

ATAR course examination 2017

Marking Key

Marking keys are an explicit statement about what the examining panel expect of candidates when they respond to particular examination items. They help ensure a consistent interpretation of the criteria that guide the awarding of marks.

Section One: Short answer

40% (68 Marks)

Question 1

(4 marks)

Outline **one** advantage and **one** disadvantage of interviews and questionnaires as data gathering techniques.

Description	Marks
Interviews	
Outlines one advantage of interviews as a data gathering technique.	1
Outlines one disadvantage of interviews as a data gathering technique.	1
Subtotal	2
Answers could include:	
Advantages:	
<ul style="list-style-type: none"> • can gather specific information and additional information • high response rate to questions. 	
Disadvantages:	
<ul style="list-style-type: none"> • time consuming • responses to interview questions are subjective. 	
Questionnaires	
Outlines one advantage of questionnaires as a data gathering technique.	1
Outlines one disadvantage of questionnaires as a data gathering technique.	1
Subtotal	2
Answers could include:	
Advantages:	
<ul style="list-style-type: none"> • easy to administer • can be anonymous. 	
Disadvantages:	
<ul style="list-style-type: none"> • fixed (inflexible) design • potential differences in understanding and interpretation. 	
Overall total	4

Question 2

(2 marks)

Give **two** reasons why a digital camera has an embedded operating system.

Description	Marks
Gives two reasons why a digital camera has an embedded operating system.	1–2
Total	2
Answers could include:	
<ul style="list-style-type: none"> • features can be enhanced by updating firmware • the camera has specialised features required only for the operating system • it is the most efficient use of the limited storage available. 	

Question 3

(3 marks)

List **three** benefits of using virtualisation.

Description	Marks
Lists three benefits of using virtualisation.	1–3
Total	3
Answers could include: <ul style="list-style-type: none"> • provide support for out of date systems • reduce spending • increase reliability • improve performance. 	

Question 4

(3 marks)

List **three** features of a file system.

Description	Marks
List three features of a file system.	1–3
Total	3
Answers could include: <ul style="list-style-type: none"> • space management • management of file names • creation of directories • management of directories. 	

Question 5

(5 marks)

A courier company has a number of drivers. Each driver is allocated a car for the term of their contract and is required to collect their car from the company yard each morning. A database for the allocation of vehicles would contain the following:

Driver (Driver's License)

Car (Car Registration; Driver's License FK)

Over time, the company has discovered that there are occasions when allocated vehicles are parked in the yard and not used.

It has been decided that a better strategy would be to allocate a driver to a car on a daily basis, rather than each driver being allocated a specific vehicle for the term of their contract.

The structure of the vehicle database has to be updated to reflect this strategy. Create a new entity that contains appropriate primary and/or foreign keys.

Description	Marks
Creates a new entity that features:	
a new intersecting entity	1
date as PK or as non-key attribute if unique PK is provided	1
Car Registration FK	1
Driver's License FK	1
composite PK or unique PK	1
Total	5
Answers could include: <ul style="list-style-type: none"> • Car_Driver (<u>Date</u>; Car Registration FK; Driver's License FK) • Car_Driver (<u>Usage_ID</u>; Car_Registration FK; Driver's_License FK; Date) 	
Note to markers: Accept other forms of separators.	

Question 6**(3 marks)**

- (a) Describe the role of open systems in database interconnectivity. (2 marks)

Description	Marks
Describes the role of open systems in database interconnectivity.	2
Provides some relevant information about open systems and database interconnectivity.	1
Total	2
Answers could include: <ul style="list-style-type: none"> open systems provide some combination of interoperability; portability or open standards it is one method or standard by which a database may be connected to a website to allow it to be data driven. 	

- (b) Name the software component that needs to be installed to enable connectivity between a data-driven website and its database. (1 mark)

Description	Marks
Names a relevant software component.	1
Total	1
Answers could include: <ul style="list-style-type: none"> a driver middleware ODBC PHP. 	

Question 7**(2 marks)**

Describe the purpose of a data dictionary, using an address book database as an example.

Description	Marks
Describes the purpose of a data dictionary, using an address book database as an example.	2
States the purpose of a data dictionary.	1
Total	2
Answers could include: <ul style="list-style-type: none"> when designing a database a data dictionary provides the description and purpose of the fields/attributes of the database table(s). For example the field name (i.e. "phone number"), the data type (text); the size of the field (10) etc. 	

Question 8

(4 marks)

The manager of an online bookstore has decided to provide customers with the option of using a smartphone application (app) to access the bookstore. His draft design for the interface of the prototype is shown below.

Identify **two** strengths and **two** weaknesses of the design using the descriptors labelled 'A', 'B', 'C' and 'D'. Indicate each strength and weakness by circling it on the diagram and labelling it with the corresponding letter name.

- A. effective navigational design
- B. ineffective navigational design
- C. logical order of use
- D. illogical order of use.

Description	Marks
Identifies two strengths of the design by circling relevant features on diagram and labelling with corresponding letters A and C.	1–2
Identifies two weaknesses of the design by circling relevant features on diagram and labelling with corresponding letters B and D.	1–2
Total	4

Question 9

(4 marks)

Rhys is the manager of a software development team and has instructed the team to minimise the costs of a current project by excluding encryption from the software solution. Outline **two** ethical concerns that a member of Rhys' team should have in relation to following this instruction.

Description	Marks
For each of the two ethical concerns:	
Outlines a relevant ethical concern that a member of Rhys' team should have in relation to following this instruction.	2
Identifies a relevant ethical concern but does not link it to the software development team/business context or the excluding of encryption from the software solution.	1
Total	4
Answers could include: The team member should be concerned that: <ul style="list-style-type: none"> • the business is not acting responsibly in providing their client with a software solution that does not ensure the security of data • they are being instructed to compromise the quality of their work/products to cut costs. 	

Question 10

(3 marks)

Explain the purpose of benchmarking in relation to computer hardware.

Description	Marks
Explains the purpose of benchmarking in relation to computer hardware.	3
Provides some relevant facts about benchmarking in relation to computer hardware.	2
Makes superficial comment/s about benchmarking.	1
Total	3
Answers could include: <ul style="list-style-type: none"> a method by which the performance of multiple computers can be compared with each other which requires the running of the same test software on each computer and comparing the speed each takes to complete the task. Examples include complex mathematical operations, calculations on a large spreadsheet and rendering a video. 	

Question 11

(7 marks)

Explain the Fetch – Execute cycle and provide an example of a Central Processing Unit (CPU) component for each stage of the cycle.

Description	Marks
Explanation	
Explains the Fetch – Execute cycle.	3
Makes some relevant comments about the stages of the Fetch – Execute cycle.	2
Identifies the stages of the Fetch – Execute cycle.	1
Subtotal	3
Answers could include: The Fetch – Execute cycle is a sequence of actions, performed by the processor as it fetches a program instruction from its memory, determines what the instruction wants to do and carries out those actions. The stages of the cycle are provided below. <ul style="list-style-type: none"> Fetch the instruction – the processor fetches the instruction from a memory address stored in a program counter and transfers the instruction, via a data bus, to an instruction register. At the end of the fetch operation, the counter points to the next instruction that will be read at the next cycle. Decode the instruction – the processor decodes the instruction stored in the instruction register, including getting any operands required to complete the instruction. Execute the instruction – the decoded instruction is executed. Store the result – the result generated by the execute phase is stored in the main memory, and/or sent to an output device. The program counter is updated with feedback from the arithmetic logic unit (ALU), to a different address from which the next instruction will be fetched. 	
Example of CPU component	
Provides an appropriate example of a CPU component for each of the four stages of the Fetch – Execute cycle.	1–4
Subtotal	4
Answers could include: Stage of the cycle and examples of CPU component: <ul style="list-style-type: none"> Fetch – program counter Decode – control unit Execute – Arithmetic Logic Unit (ALU) Store – register or RAM. 	
Overall total	7

Question 12

(3 marks)

Outline **three** characteristics of records as a data type.

Description	Marks
Outlines three characteristics of records as a data type.	1–3
Total	3
Answers could include: <ul style="list-style-type: none">• allows for a complex structure• encapsulates multiple data types as elements• has a fixed number of elements• has a fixed sequence of elements.	

Question 13

(2 marks)

Describe the role of a repeater when used in a network.

Description	Marks
Describes the role of a repeater when used in a network.	2
Identifies aspect/s of the role of a repeater.	1
Total	2
Answers could include: <ul style="list-style-type: none">• a repeater will amplify a signal and resend it to overcome reduction in signal strength (attenuation) because over a distance network signals diminish in size/amplitude (are attenuated) due to characteristics of the media.	

Question 14**(3 marks)**

Consider the following pseudocode, then answer the questions that follow.

Module Age2Animal (Name, Age)
Choice ← ''

If Age < 5 then
 Choice ← 'Zebra'
Else
 Choice ← 'Aardvark'
End If

Output (Name, ' likes the animal ', Choice)

- (a) Identify **one** local variable. (1 mark)

Description	Marks
Choice	1
Total	1

- (b) List **one** parameter. (1 mark)

Description	Marks
Any one of:	
• Name	1
• Age	
Total	1

- (c) State the output when the call Age2Animal('Jenny', 5) is executed. (1 mark)

Description	Marks
Jenny likes the animal Aardvark	1
Total	1

Question 15

(2 marks)

Satellite services are used to provide broadband internet connectivity to regional and remote areas of Australia. State **one** advantage and **one** disadvantage of using satellites for this purpose.

Description	Marks
Advantage	
States one advantage of using satellites in the provision of broadband internet services.	1
Subtotal	1
Answers could include: <ul style="list-style-type: none"> • can cover large areas • requires minimal land-based transmission support • requires minimal infrastructure to provide internet access • minimal impact by environment or humans. 	
Disadvantage	
States one disadvantage of using satellites in the provision of broadband internet services.	1
Subtotal	1
Answers could include: <ul style="list-style-type: none"> • transmission speeds are not comparable with other forms of transmission • data costs are expensive by comparison to other forms of transmission • expensive to deliver. 	
Overall total	2

Question 16

(2 marks)

Describe the purpose of a stub in programming.

Description	Marks
Describes the purpose of a stub in programming.	2
Identifies aspect/s of a stub.	1
Total	2
Answers could include: <ul style="list-style-type: none"> • a stub is a simple program routine that stands in for a routine to be written at a later date. This allows the main program to be tested without all the modules being fully completed • a stub is a simple program (module) used in the development and testing of a larger program. 	

Question 17

(1 mark)

State the primary function of the Dynamic Host Configuration Protocol (DHCP) protocol.

Description	Marks
it generates and/or allocates an IP address	1
Total	1

Question 18

(3 marks)

List **three** characteristics of Internet Protocol version 6 (IP6).

Description	Marks
Lists three characteristics of Internet Protocol version 6 (IP6).	1–3
Total	3
Answers could include: <ul style="list-style-type: none"> • has a significantly larger address pool than previous version • features a client-side address assignment • has built-in encryption • enables one device to have many network addresses. 	

Question 19

(6 marks)

Explain **two** ways in which an interpreter and a compiler are different.

Description	Marks
For each of the two ways:	
Explains the way in which an interpreter and a compiler are different.	3
Makes general comment/s about the way in which an interpreter and a compiler are different.	2
Makes superficial comment/s about an interpreter and/or a compiler.	1
Total	6
Answers could include: <ul style="list-style-type: none"> • they execute code differently – a compiler reads a complete program at once, an interpreter reads a program line-by-line • they identify errors in different ways – a compiler does not allow a program to run until error-free, an interpreter runs the program until the first error. 	

Question 20

(6 marks)

Explain each of the strategies listed below.

Description	Marks
Phishing	
Explains the strategy of phishing.	3
Makes some relevant comment/s about phishing.	2
Identifies a relevant aspect of phishing.	1
Subtotal	3
Answers could include: Phishing is a strategy that encourages a computer user to part with sensitive information such as bank details hence the term 'phishing' – i.e. fishing – trying to catch someone out. For example a perpetrator sends a user an email that appears to be genuine, for example, pretending to be a bank or a lawyer requesting that the user verify bank account details or send money to assist in the completing of a legal case.	
Denial of Service (DoS)	
Explains the strategy of DoS.	3
Makes some relevant comment/s about DoS.	2
Identifies a relevant aspect of DoS.	1
Subtotal	3
Answers could include: DoS is a means of attack on a specific user/system/website which involves overloading a target with too much network traffic resulting in system slowdown, shutdown or a violation of security.	
Overall total	6

Section Two: Extended answer

60% (111 Marks)

Question 21

(45 marks)

- (a) Give **two** characteristics of each of the system development methodologies listed below. (4 marks)

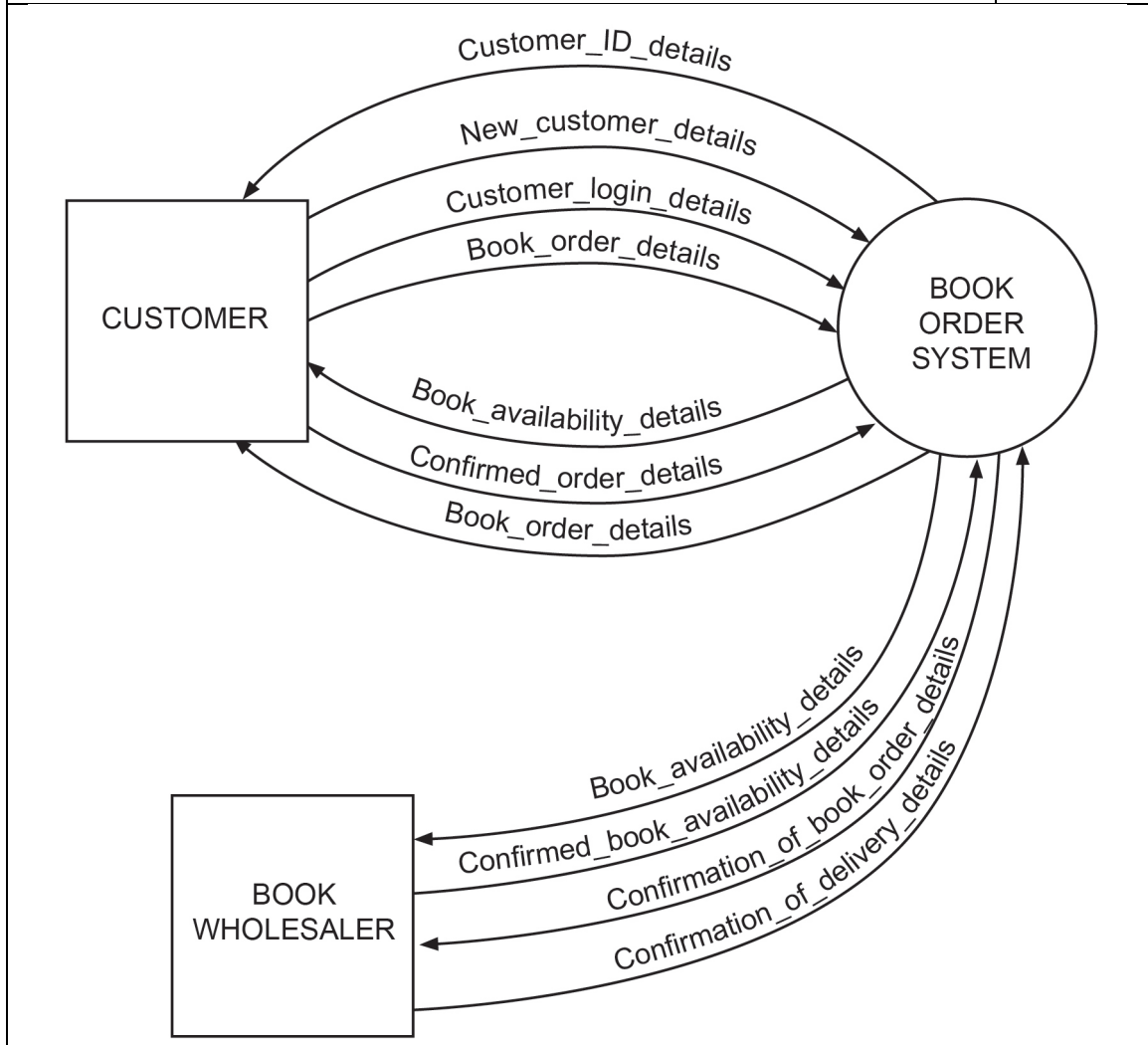
Description	Marks
Linear methodology	
Gives two characteristics of linear (waterfall/cascade) methodology.	1–2
Subtotal	2
Answers could include:	
<ul style="list-style-type: none"> • a project is divided into stages or phases • it is sequential, each stage needs to be completed before moving on • clear goals are set for each stage. 	
Iterative methodology	
Gives two characteristics of iterative (rapid application development) methodology.	1–2
Subtotal	2
Answers could include:	
<ul style="list-style-type: none"> • effective in producing a working prototype in a short period of time • involves extensive user input and testing • based on build – test – evaluate process, philosophy is re-build until users are completely satisfied • features user input throughout the process which enables ongoing, responsive changes to be made to design. 	
Overall total	4

- (b) As a member of the development team creating the BooX4us system, justify which of these methodologies would be the most suitable to use for the project. (2 marks)

Description	Marks
Justifies using iterative methodology to create the BooX4us system as it creates a smaller version of the system, can be built quickly and allows for user input.	2
Identifies iterative methodology as the most suitable methodology to use for creating the BooX4us system.	1
Total	2

(c) Complete the context diagram below for the BooX4us online book order system. (10 marks)

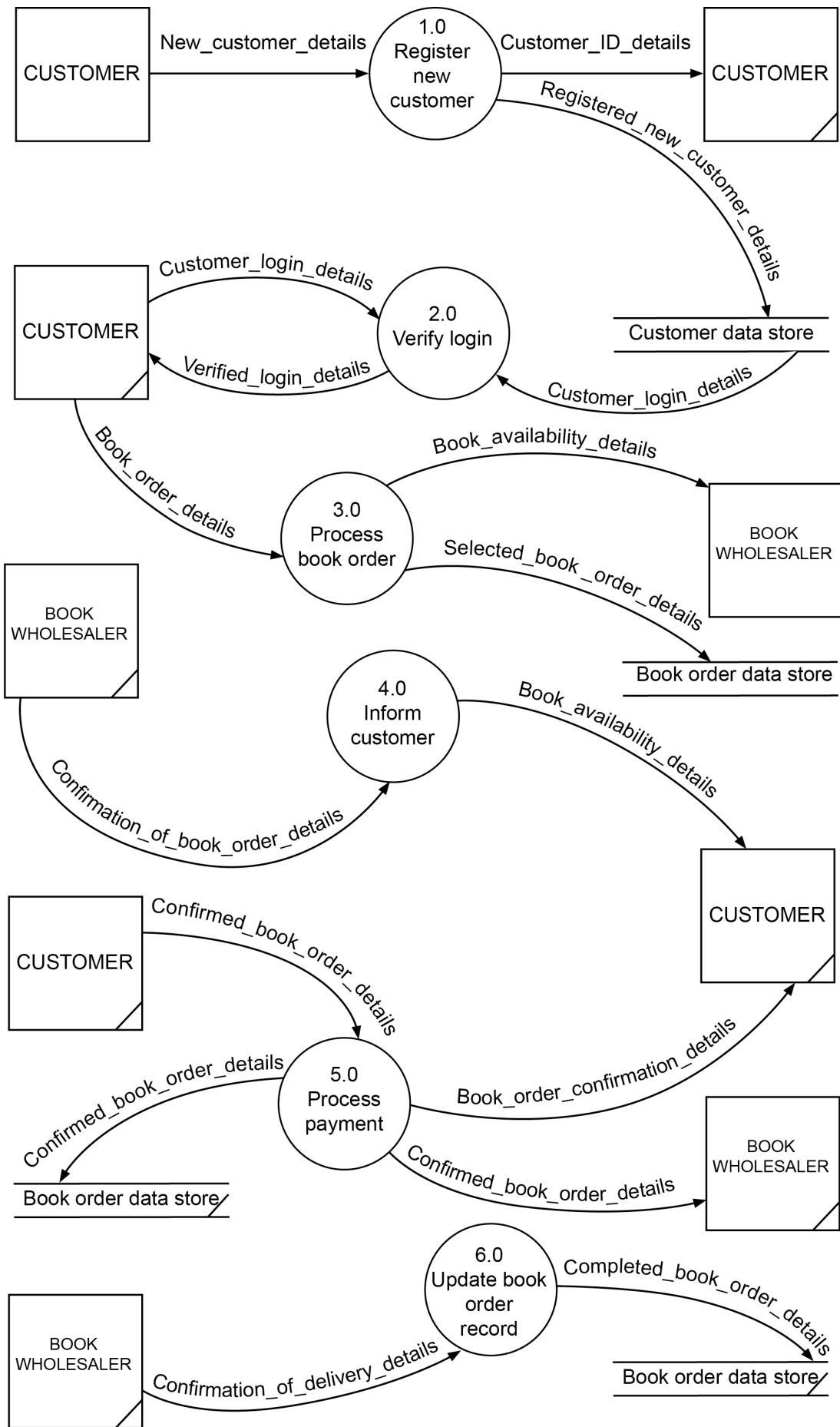
Description	Marks
Completes the context diagram for the BooX4us online book order system by adding:	
Entity (<i>appropriately named</i>)	
• BOOK WHOLESALER	1
Subtotal	1
Data flows (drawn in correct direction and labelled appropriately)	
<ul style="list-style-type: none"> • Customer login details • Book order details • Book availability details • Confirmed book order details • Book order confirmation details • Book availability details • Confirmed book availability details • Confirmation of book order details • Confirmation of delivery details 	1-9
Subtotal	9
Overall total	10



Question 21 (continued)

- (d) Complete the Level 0 Data Flow Diagram below for the BooX4us online book order system. (20 marks)

Description	Marks
Completes the Level 0 Data Flow Diagram by adding:	
Entities	
• BOOK WHOLESALER	1
Subtotal	1
Data stores (named appropriately)	
• Customer data store • Book order data store	1–2
Subtotal	2
Processes (named appropriately)	
• 2.0 Verify login • 3.0 Process book order • 4.0 Inform customer • 5.0 Process payment • 6.0 Update book order records	1–5
Subtotal	5
Appropriate data flows (drawn in correct direction and labelled appropriately)	
1.0 Register new customer	
Appropriate data flow/s in: New customer details	1
Appropriate data flow/s out: Customer ID details and Registered new customer details	1
2.0 Verify login	
Appropriate data flow/s in: Customer login details and Customer login details	1
Appropriate data flow/s out: Verified login details	1
3.0 Process book order	
Appropriate data flow/s in: Book order details	1
Appropriate data flow/s out: Book availability details and Selected book availability details	1
4.0 Inform customer	
Appropriate data flow/s in: Confirmation of book order details	1
Appropriate data flow/s out: Book availability details	1
5.0 Process payment	
Appropriate data flow/s in: Confirmed book order details	1
Appropriate data flow/s out: Confirmed book order details and Book order confirmation details	1
6.0 Update book order records	
Appropriate data flow/s in: Confirmation of delivery details	1
Appropriate data flow/s out: Completed book order details	1
Subtotal	12
Overall total	20
Note to markers: The Data Flow Diagram provided is just one example of a DFD that can be drawn for the BooX4us online book order system. Accept other relevant DFDs.	



Question 21 (continued)

- (e) With reference to your Level 0 DFD, draw a Level 1 DFD by expanding Process 1.0 Register new customer. (9 marks)

Description	Marks
Draws a Level 1 DFD by expanding Process 1.0 Register new customer, that features:	
Processes (named appropriately and different from Level 0 process names)	
<ul style="list-style-type: none"> 1.1 Check all details entered 1.2 Check not existing customer 1.3 Create ID 	1–3
Subtotal	3
Data flows (drawn in correct direction and labelled appropriately) Note to markers: The data flow into process 1.1 and 1.3 are not awarded marks.	
<ul style="list-style-type: none"> Valid new customer details Checked new customer details Existing customer details New customer details 	1–4
Subtotal	4
Data store (named appropriately)	
Customer data store	1
Subtotal	1
Balance	
balanced with level 0 DFD	1
Subtotal	1
Overall total	9
Note to markers: The Data Flow Diagram provided is just one example of a DFD that can be drawn for the BooX4us online book order system. Accept other relevant DFDs.	

Question 22

(21 marks)

(a) Using Chen notation, draw an ER diagram that includes the following:

- the names of all primary keys
- the names of all foreign keys
- the relationships
- the cardinality.

(11 marks)

Description	Marks
Draws a relevant ER diagram for the given context that includes: Chen notation	
Uses Chen notation appropriately	1
Subtotal	1
Entities, relationships and cardinalities. Note: markers need to consider the candidate's interpretation of the given context and the ER diagram they have drawn.	
Identifies all entities, relationships and cardinalities correctly.	5
Identifies all entities and most relationships and cardinalities correctly.	4
Identifies all entities and some relationships and cardinalities correctly.	3
Identifies most entities and some relationships and/or cardinalities correctly.	2
Identifies some entities and some relationships and/or cardinalities correctly.	1
Subtotal	5
Primary keys (appropriate to entities). Note: markers need to consider the candidate's interpretation of the given context and the ER diagram they have drawn. Allow for the potential inclusion of composite key(s) for an associative entity.	
Identifies all primary keys correctly.	3
Identifies most primary keys correctly.	2
Identifies some primary keys correctly.	1
Subtotal	3
Foreign keys (appropriate to entities). Note: markers need to consider the candidate's interpretation of the given context and the ER diagram they have drawn.	
Identifies all foreign keys correctly.	2
Identifies some foreign keys correctly.	1
Subtotal	2
Overall total	11

Question 22 (continued)

- (b) In reflecting on the BooX4us database, the development team has realised that books can be sourced from more than one wholesaler. Represent below how you would extend your ER diagram to take this information into account. Include the entities and appropriate primary and foreign keys. You **must** use the following as a structure for your answer. (6 marks)

Description	Marks
Represents how they would extend their ER diagram to take into account the information relating to the wholesaler by indicating:	
entities named appropriately	1–2
Subtotal	2
primary keys appropriate to entities	1–2
Subtotal	2
foreign keys appropriate to entities	1–2
Subtotal	2
Overall total	6
Note to markers: The representation of the ER diagram extension below is just one example of how it can be done. Accept other relevant representations, including diagrams.	
<p>Entities:</p> <ul style="list-style-type: none"> • Wholesaler/Book • Wholesaler <p>Keys:</p> <p>For entity Wholesaler/Book</p> <ul style="list-style-type: none"> • <u>Wholesaler ID & ISBN</u> (composite PK) <p>Or</p> <ul style="list-style-type: none"> • <u>Wholesaler/Book ID</u> • Wholesaler ID (FK); ISBN (FK) <p>For entity Wholesaler</p> <ul style="list-style-type: none"> • <u>Wholesaler ID</u> 	

(c) Refer to your ER diagram and write a query using Structured Query Language (SQL) that will include:

- FirstName
- LastName
- OrderNumber
- Totalcostoforder.

(4 marks)

Description	Marks
Refers to their ER diagram and writes a query that features:	
correct syntax i.e. SELECT Field name...FROM Table name...	1
fields that are listed correctly	1
fields based on part (a) that are named appropriately	1
entities based on part (a) that are named appropriately	1
Total	4
Note to markers: The query below is just one example of a query that can be written for the ER diagram. Also accept dot notation.	
SELECT FirstName, LastName, OrderNumber, Totalcostoforder FROM Customer, Order	

Question 23

(22 marks)

- (a) Examine the module above and complete the trace table below for the input parameters (-10, 10, 'Item: '). (3 marks)

Description	Marks
Correctly completes the three columns in the trace table. (See entries in the table below.)	1–3
Total	3
Note to markers: Do not award marks to values provided for the text parameter.	

Line#	X	Y	YOffset
01	-10	10	0
02	-10	10	0
03	0	10	0
04	0	10	0
05	0	10	0
06	0	10	0
07	0	10	0
08	0	10	14
09	0	10	14
10	0	10	14

- (b) It has been identified that the module DisplayText does not check to determine whether the value to the parameter is within a certain range. The programmer for the development team attempts to add some range checking code between lines 07 and 08, shown below (by the three lines marked 07.1, 07.2 and 07.3), but introduces another error. On what line is the error? Write the correct code. (2 marks)

Description	Marks
error is on line 07.2	1
correct code is $Y \leftarrow 24$	1
Total	2

- (c) Given the information above, write a module in pseudocode that:
- converts coordinates from the old system (80 x 24) to those used in the new system (640 x 480)
 - ensures that in the new coordinate system (0, 0) is in the bottom left-hand corner of the screen and (640, 480) is in the top right-hand corner of the screen
 - passes the old coordinate pair as value parameters and returns the new coordinate pair in reference parameters. (10 marks)

Description	Marks
Writes a module in pseudocode that features:	
parameter list that contains four values	1
correct computation of new X value: $NewX \leftarrow OldX * 640/80$	1–3
correct computation of new Y value: $NewY \leftarrow OldY * 480/24$	1–3
assignment of new values to reference parameters	1–2
closure of module	1
Total	10
Note to markers: The module in pseudocode below is just one example of a module that can be written. Accept other relevant modules.	
Module ConvertCoordinates(OldX, OldY, NewX, NewY) $NewX \leftarrow OldX * 640/80$ $NewY \leftarrow OldY * 480/24$ End Module	

- (d) Write a function in pseudocode (using a case statement) to calculate the discounted price for a book order. (7 marks)

Description	Marks
Writes a function in pseudocode, using a case statement, to calculate the discounted price for a book order and that features:	
the initialising of a variable that stores the discounted cost	1
correct syntax of selection structure (case statement)	1
Correct computation of discounted cost: $< 100 : Total \leftarrow TotalCost$ $\leq 200 : Total \leftarrow TotalCost * 0.95$ $> 200 : Total \leftarrow TotalCost * 0.9$	1–3
assignment of final value to function	1
closure of function	1
Total	7
Note to markers: The function below is just one example of a function that can be written to calculate the discounted price for a book order. Accept other relevant functions that use a case statement.	
Function AdjustOrderCost(TotalCost) $Total \leftarrow 0$ Case TotalCost of $< 100 : Total \leftarrow TotalCost$ $\leq 200 : Total \leftarrow TotalCost * 0.95$ $> 200 : Total \leftarrow TotalCost * 0.9$ End Case $AdjustOrderCost \leftarrow Total$ End Function	

Question 24

(23 marks)

- (a) Jack has read about the BooX4us bookstore and is keen to purchase books online. He has upgraded his wireless router/modem in order to get a more reliable internet connection. The device he is using has the default administrator password of 'password' and has the wireless encryption activated. Give **two** reasons why Jack should change the administrator password. (2 marks)

Description	Marks
Gives two valid reasons why Jack should change the administrator password.	1–2
Total	2
Answers could include: <ul style="list-style-type: none"> to ensure better security as lists of default passwords can be easily sourced on the world wide web to provide security beyond potentially weak encryption. 	

- (b) Describe **two** benefits to BooX4us of installing a Network Attached Storage (NAS) system. (4 marks)

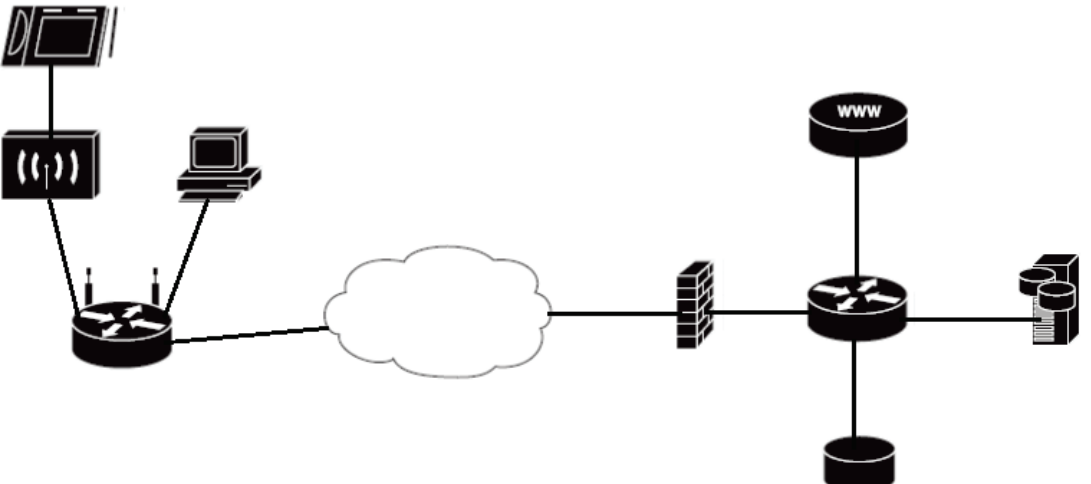
Description	Marks
For each of the two benefits:	
Describes the benefit to BooX4us of installing a NAS system.	2
Makes general comment/s about the benefit of installing a NAS system.	1
Total	4
Answers could include: <ul style="list-style-type: none"> provides centralised storage which means that the business is not relying on multiple devices with their own hard disk storage device allows for shared storage which means that multiple users across multiple devices can access the one storage device is a familiar system (file-oriented) which to the user just seems to be an extension of their computer's file system, hence easy to use. 	

- (c) A customer has complained that the BooX4us website is very slow, particularly when viewing images of products. Provide **two** reasons why the network performance may be an issue and explain how you could solve **one** of them. (5 marks)

Description	Marks
Reasons	
Provide two reasons why the network performance may be an issue.	1–2
Subtotal	2
Answers could include: <ul style="list-style-type: none"> customer has bandwidth bottleneck poor network design data collisions. 	
Explanation	
Explains how they can solve one of the reasons why the network performance may be an issue.	3
Makes general comment/s about how they can solve one of the reasons why the network performance may be an issue.	2
Makes superficial comment/s about solving one of the reasons why the network performance may be an issue.	1
Subtotal	3
Answers could include: <ul style="list-style-type: none"> the customer should get a router upgrade to one of a higher speed which will reduce the bandwidth bottle neck at their house the network should be analysed to determine whether the bottle neck is at the BooX4us end or the customer's end. BooX4us may not have fast enough web servers to cope with the demand the customer could do a speed check to test his/her internet speed. 	
Overall total	5

Question 24 (continued)

- (d) Using Cisco conventions, draw a network diagram that shows a customer connected to a home-based, local area network and the BooX4us system. The customer’s home network consists of a wireless router, a tablet device using a wireless connection and a desktop computer with a wired connection. The BooX4us system consists of a firewall, router, Network Attached Storage (NAS), database server and web server. (12 marks)

Description	Marks
Draws a network diagram that features:	
Sequencing of devices/components for the given connection	
<ul style="list-style-type: none"> • tablet device • wireless modem or wireless modem with wireless access point (WAP) • desktop computer • internet • firewall • router • database server • web server • NAS 	1–9
Subtotal	9
CISCO conventions used appropriately for components	
<ul style="list-style-type: none"> • server • firewall • router 	1–3
Subtotal	3
Overall total	12
<p>Note to markers: The network diagram provided is just one example of how it can be drawn, accept other relevant configurations. For example, the firewall and router could be drawn as a single device, the wireless modem could be a cable modem and the wireless access point (WAP) may not be drawn due to the wireless modem only being represented.</p>	
	

ACKNOWLEDGEMENTS

Question 24(d) Cisco. (n.d.). [Cisco network topology icons]. Retrieved November, 2017, from <https://www.cisco.com/c/en/us/about/brand-center/network-topology-icons.html>

Cisco™ is registered trademark of Cisco Systems, Inc.

This document – apart from any third party copyright material contained in it – may be freely copied, or communicated on an intranet, for non-commercial purposes in educational institutions, provided that it is not changed and that the School Curriculum and Standards Authority is acknowledged as the copyright owner, and that the Authority's moral rights are not infringed.

Copying or communication for any other purpose can be done only within the terms of the *Copyright Act 1968* or with prior written permission of the School Curriculum and Standards Authority. Copying or communication of any third party copyright material can be done only within the terms of the *Copyright Act 1968* or with permission of the copyright owners.

Any content in this document that has been derived from the Australian Curriculum may be used under the terms of the Creative Commons [Attribution 4.0 International \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) licence.

*Published by the School Curriculum and Standards Authority of Western Australia
303 Sevenoaks Street
CANNINGTON WA 6107*