Semester 1 Examination, 2020
Question/Answer Booklet

SAMPLE EXAM PAPER
COMPUTER SCIENCE ATAR Year 11
Unit 1

Student Name: ANSWERS

Student Number: | | | | | | | |

Teacher's Name: Ms 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: NIL

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	18	18	70	**70**	54
Section Two: Extended answer	4	4	80	**60**	46
			Total	**130**	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 [70 MARKS]

Question 1 (2 marks)

For each of the devices listed below, indicate with a tick (√) whether it is an input or output device.

Name	Input	Output
Printer		√
Microphone	√	
Joy stick	√	
Projector		√

Question 2 (2 marks)

Describe the main difference between primary and secondary storage.

Primary storage is directly accessible by the CPU whereas with secondary storage the data/files need to be loaded into RAM before it can be used.

Question 3 (2 marks)

Joe wants to download and store 24 TV shows that are 600MB each + 2 movies that are 1.3 GB each. Will these all fit onto a 15GB external hard-drive? **Justify your answer**.

24 * 600MB = 14400MB = 14400/1024 = 14.4GB

2 * 1.3 = 2.6GB Total required = 14.1 + 2.6 = 16.7GB

No it will not.

Question 4 (1 mark)

What is troubleshooting?

Troubleshooting is the process of identifying and fixing problems in a computer system.

Question 5 **(5 marks)**

Fill in the blanks with appropriate systems architecture terminology that matches the descriptions given below:

Terminology	Description
System clock	Produces pulses at a fixed rate to synchronize computer operations
Program counter	A special register that stores the address of the next instruction to be processed
Arithmetic Logic Unit (ALU)	Contains circuitry that executes the arithmetic and logical calculations
Standard Operating Environment (SOE)	A set implementation of an operating system (OS) and its associated hardware and software applications for all computers in a business
Bus	A set of parallel wires that move data as signals from one component on the motherboard to another.

Question 6 **(3 marks)**

a. (1 mark)
What is booting?

Process of starting the computer.

b. (2 marks)
How is a warm boot different to a cold boot?

A warm boot is using the operating system to restart the computer whereas a cold boot is turning on the computer after it has been powered off.

Question 7 **(1 mark)**

Describe a preventative maintenance task that a user can perform to keep a computer functioning correctly.

Install a virus checker (½) so that any viruses can be detected and removed. (½)
Defrag the hard drive so that files are clustered together for quicker retrieval

Question 8 **(2 marks)**

Describe two advantages of preventative maintenance on a computer system.

- *Saves Money*: Handling the problem areas in a PC before actually facing a problem, essentially reduces the possibility of a sudden breakdown and the associated expenditure.
- *Saves Time*: Troubleshooting the components and their repair procedures take more time as compared to preventive maintenance procedures. Performing preventive maintenance procedures reduces the possibility of system failures and data loss.
- *Improves Performance*: As time goes by, some components of a PC such as mouse and keyboard degrade in performance. Preventive maintenance helps in improving the performance and life of these components
- *Safeguards Data*: Preventive maintenance procedures can be used to protect hardware devices such as hard disk drives and as a result, to safe guard the software(s) and the user data stored on these drives

Question 9 **(4 marks)**

List two advantages and two disadvantages of using prototyping.

Advantage	Disadvantage
It can be a quick development method Errors and problems can be identified and fixed easily Users are involved in the development so they will be happy to use the new system Users have lots of input into the development, so it will be exactly what they want. Because it is quick, it will be relative cheap to construct	Sometimes the user will always want extra things added that weren't in the initial design (project will never end!!) Users may have different opinions on what improvements are needed. It may move closer to the old system if users don't want to change, even though it is not efficient. (The old system can do this, I want the new system to also do that)

Question 10 **(6 marks)**

Name the 6 stages of the Systems Development Life Cycle (SDLC).

Stage 1	Preliminary analysis
Stage 2	Analysis
Stage 3	Design
Stage 4	Development
Stage 5	Implementation
Stage 6	Evaluation and maintenance

Question 11 **(6 marks)**

a. (1 mark)
What is project management?

Project management is the process of planning, organising and monitoring the project.

b. (4 marks)
Project management involves four steps: planning, budgeting, scheduling and tracking of the project. Indicate in what steps the following tasks would occur.

Task	Step
Break the project into a series of tasks and estimate how long each task will take to complete.	Planning
Once the project has started, the actual start and finish dates for each task are entered into a special Gantt chart to provide an up-to-date picture of the tasks that are on time and those that are lagging.	Tracking
Create a list of resources (human, material, technical) and predict the cost of using that resource,	Budgeting
Create a Gantt chart to display the order and duration of tasks against the progression of time.	Scheduling

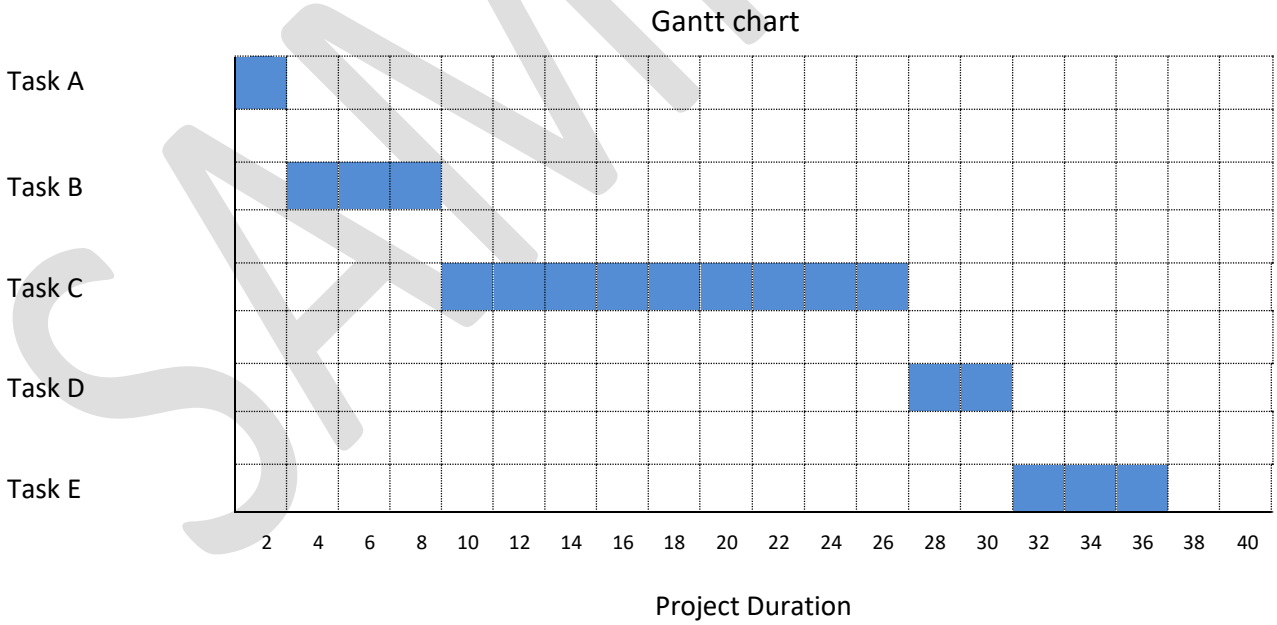
c. (1 mark)
Why is project management needed?

It is needed so that the project is completed on time and within budget.

Question 12 **(6 marks)**

a. (5 marks)
Use the estimated data provided below for a project to complete the Gantt chart below. Each square represents 2 days.

Activity	Estimated Duration (length)	Predecessor
Task A	2 days	
Task B	6 days	Task A
Task C	18 days	Task B
Task D	4 days	Task C
Task E	6 days	Task D



b. (1 mark)
How long is the project expected to take? 36 days.

Question 13 **(3 marks)**

	A	B
1	**Player Results**	
2		
3		**Points scored**
4	Josh	20
5	Luke	15
6	Kai	12
7	Nathan	6
8	Rob	11
9	Colin	28
10	Mustafa	19
11		
12	**Total**	111
13	**Average**	
14	**Highest**	
15	**Lowest**	

Write the formulae should be entered into each of the following cells.

B13 =average(B4:B10)

B14 =max(B4:B10)

B15 =min(B4:B10)

Question 14 **(2 marks)**

C5 =B5*B2

	A	B	C	D	E
1	**Weekly Wages**				
2		**Rate:**	$ 21.50		
3					
4	**Name**	**Hours**	**Wages**		
5	Williams	20.0	$ 430.00		
6	White	30.0			
7	McMahan	40.0			

In the above spreadsheet, C5 has the formula **= B5 * B2** entered. It uses absolute cell and relative cell referencing. Explain why the two referencing types are necessary?

B5 is the relative cell reference so that when the formula is filled down the cell reference will adjust automatically to match the row that it is on whereas B2 is an absolute cell so that when the formula is filled down it will continue referring to B2

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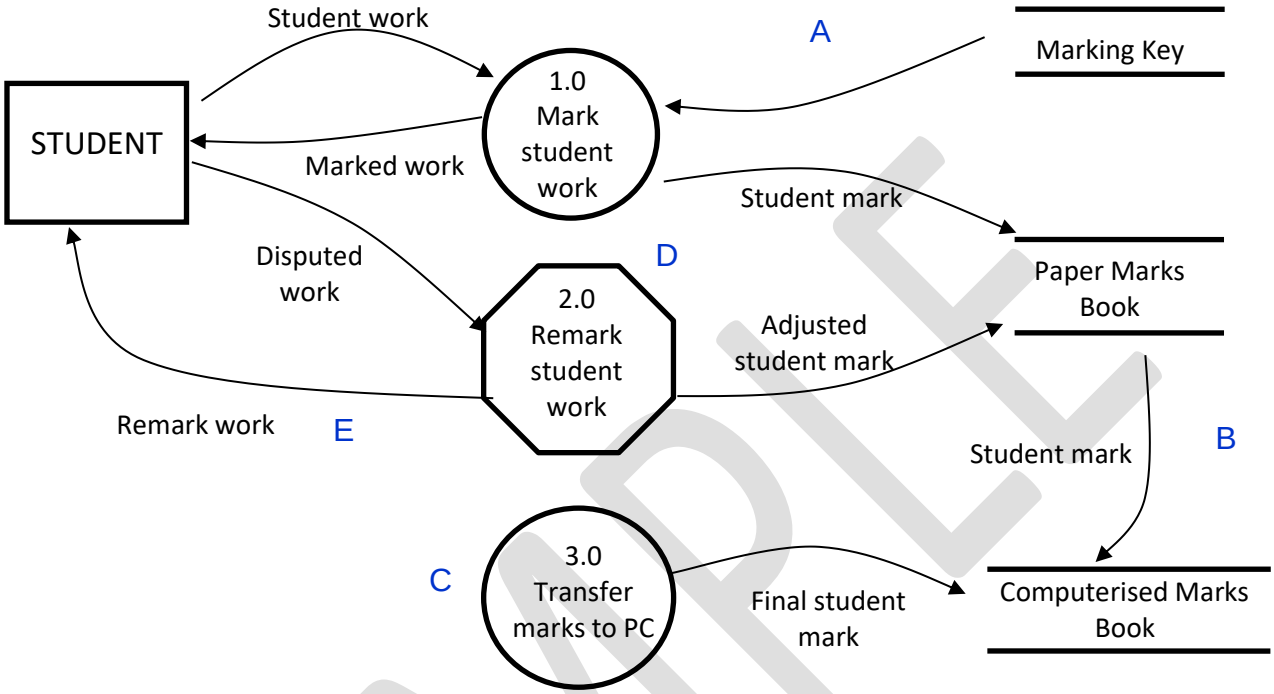
Question 15 **(5 marks)**

List 5 things that are wrong with the following data flow diagram. Label the diagram with the letters A, B, C, D and E to indicate the location of the errors.

Level 0 Data Flow Diagram for the Student Assessment System



A	There is no name on the data flow
B	Data can't flow directly from one data store to another data store (must go through a process)
C	Only has a data flow coming out of the process. Must have data going in and out.
D	Process must be a circle.
E	Remark work data flow has to be in a noun – not verb. Remarked work

Question 16 (7 marks)

Refer to the tables given below to answer the following questions:

GroupCode	GroupName	Description	NumDiffSpecies	WarmBlood
AMP	Amphibian	A cold-blooded vertebrate animal having moist skin without scales. Most amphibians lay eggs in water, and their young breathe with gills but develop lungs and breathe air as adults. Amphibians include frogs, toads, and salamanders.	7665	☐
BIR	Bird	A warm-blooded, egg-laying vertebrate animal that has wings for forelimbs, a body covered with feathers, a hard bill covering the jaw, and a four-chambered heart.	10200	☑
FISH	Fish	A cold-blooded vertebrate animal that lives in water. It has gills for obtaining oxygen, a lateral line for sensing pressure changes in the water, and a vertical tail. Most fish are covered with scales and have limbs in the form of fins.	29000	☐
INV	Invertebrates	An animal that lacks a backbone and internal skeleton. It has a relatively simple anatomy and behavior. Includes insects, worms, arthropods, sponges, molluscs, octopuses	1305075	☐
MAM	Mammal	Any of various warm-blooded vertebrate animals whose young feed on milk that is produced by the mother's mammary glands. It has a diaphragm that separates the heart and lungs from the other internal organs, red blood cells that lack a nucleus, and usually hair or fur.	5500	☑
REP	Reptile	Cold-blooded vertebrates that have lungs, an outer covering of horny scales or plates, and young produced in amniotic eggs. Includes tortoises, turtles, snakes, lizards, and crocodiles	7925	☐

tblAnimalGroup

AnimalCode	AnimalName	Diet	AnimalGroupFK
BEE	Bee	Flower nectare	INV
BNOSE	Bottle-nosed dolphin	Small fish	MAM
CRI	Cricket	Plant, dead insects, seeds, leather, cloth	INV
ECH	Echidna	Ants and termites	MAM
EMU	Emu	Insects and native plants	BIR
GRTUR	Green sea turtle	Small fish	REP
HUMPB	Humpback whale	Fish	MAM
KOA	Koala	Eucalyptus leaves	MAM
SCROC	Saltwater crocodile	Anything they like!	REP

tblAnimalDetails

SEE NEXT PAGE

a. (2 marks)
Explain what will happen (and why) if you try to add the following data to tblAnimalDetails. Make sure you use the previous tables on page 10 in your explanation.

AnimalCode	AnimalName	Diet	AnimalGroupFK
LRTF	Little Red Tree Frog	Flies, bugs, grasshoppers, crickets, moths and other insects.	FRO

A error message box will appear indicating that there is an referential integrity error (1) as FRO is not a valid foreign key – it does not have a matching value AnimalGroupID field in tblAnimalGroup (1)

b. (1 mark)
Enter the criteria to the QBE grid to create a query so that it will list all the animal groups that have more than 10000 different species.

Field:	GroupName	NumDiffSpecies	
Table:	tblAnimalGroup	tblAnimalGroup	
Sort:			
Show:	☑	☑	☐
Criteria:		>10000	
or:			

c. (2 marks)
Fill in the QBE grid to create a query so that it will list all the animals that are warm blooded.

Field:	AnimalName	WarmBlooded	
Table:	tblAnimalDetails	tblAnimalGroup	
Sort:			
Show:	☑	☐	☐
Criteria:		Yes / True	
or:			

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d. (2 marks)
Enter the criteria to the QBE grid to create a query so that it will list all the animals that belong to the mammal animal group and have some type of fish in their diet.

Field:	AnimalName	GroupName	Diet
Table:	tblAnimalDetails	tblAnimalGroup	tblAnimalDetails
Sort:			
Show:	☑	☐	☑
Criteria:		Mammal	*fish*
or:			

Question 17 **(5 marks)**

a. (5 marks)
List the 3 parts of buses and explain what it does.

i. data bus - transmits the actual data
ii. address bus - transfers the information about where the data should go
iii. control bus - controls memory access and input/output operations.

b. What is the advantage of a computer with a larger bus size (width)?

A larger bus size can transfer more data faster than a smaller bus size.

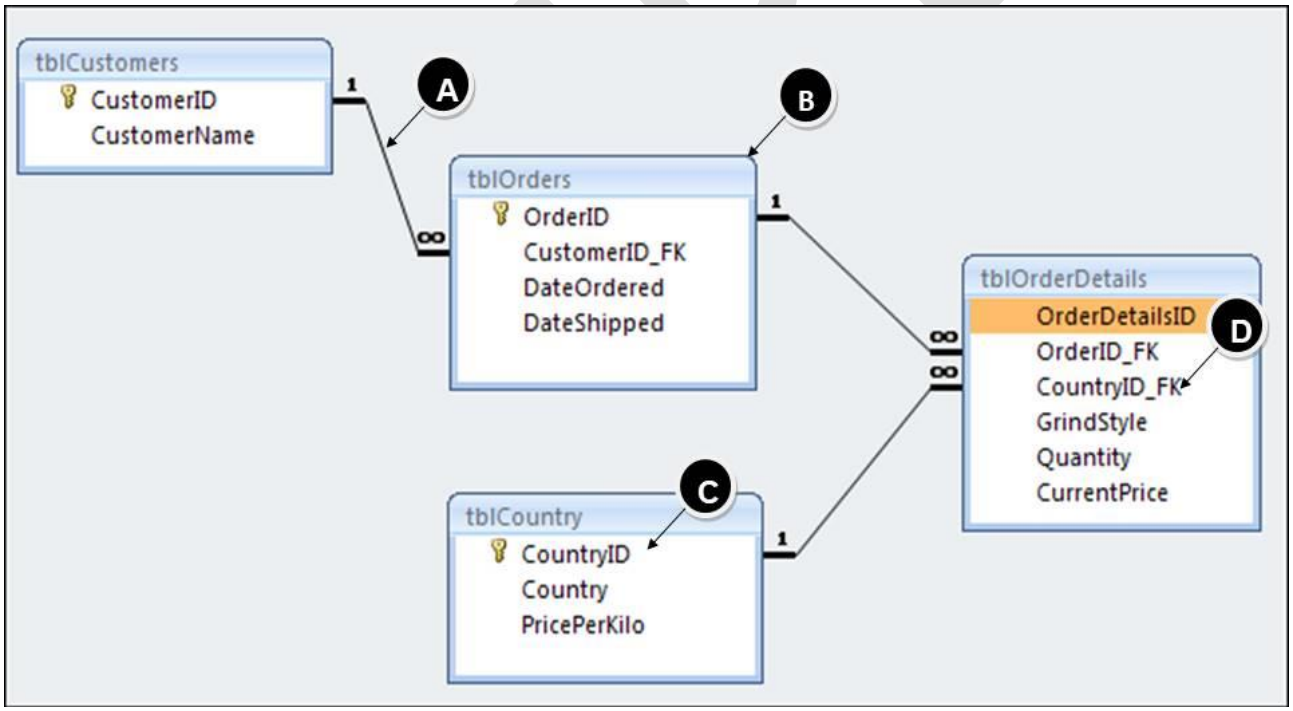
c. What is the unit measurement for bus speed?

Gigahertz

Question 18 **(8 marks)**

Use the diagram below to name and list the purpose of each labelled database element.

Label	Name	Purpose
A	Relationship	Line that links the two tables together
B	Table	Structure that stores the data about a particular object or thing (eg orders)
C	Primary key	Uniquely identifies each record in the table
D	Foreign key	Store a value that must match a value in the linked tables primary key field.

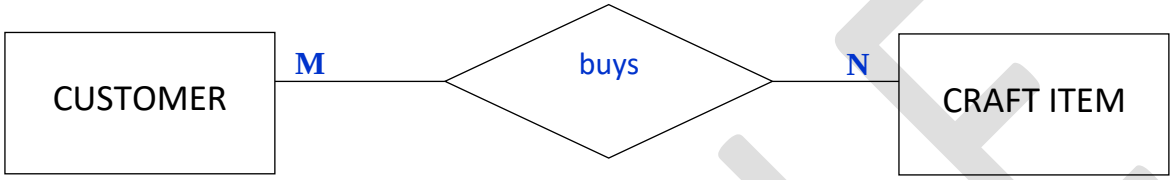


SECTION TWO - EXTENDED ANSWERS [60 MARKS]

Question 19 (12 marks)

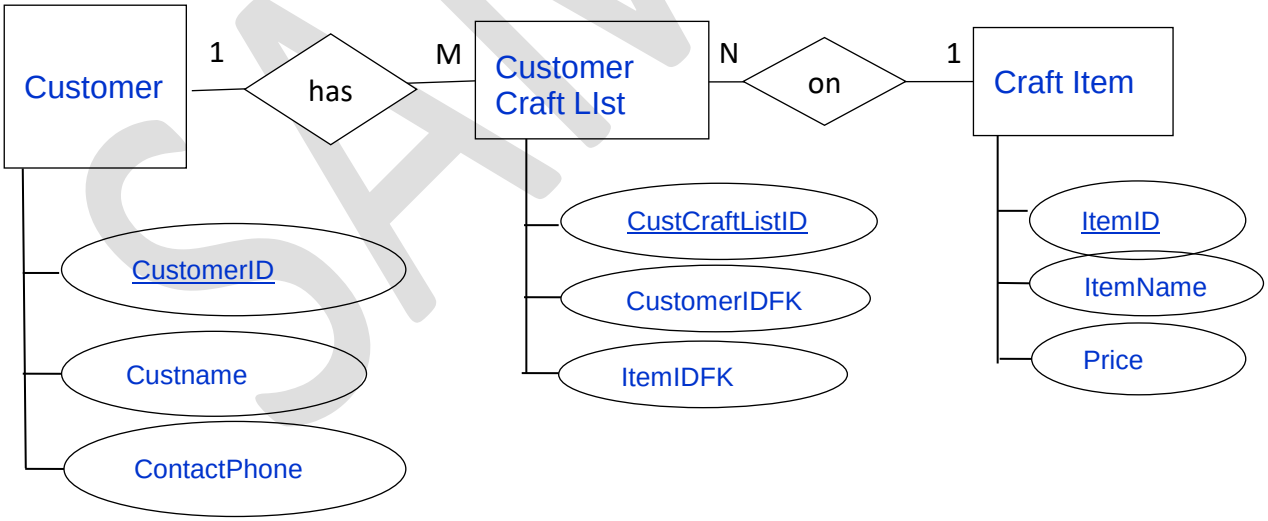
Crafty Crafts is a small business that sells items created by local crafts people. A customer can buy many different items and an item can be bought by many customers.

a. (2 marks)
Complete the ERD below so show the relationship and cardinality between customers and craft items.



b. (10 marks)
Complete the ERD below so as to resolve the M:N relationship. Remember to include the following in the new ERD:

- Give an appropriate name to the third entity
- Add the relationship and cardinality
- Add at least three attributes to each entity
- Underline the primary keys.
- Add the required foreign keys to the appropriate entity



Intersecting entity	1
Relationships	2
Pks	3
FKs	2
Fields	2

Question 20 **(7 marks)**

a. (4 marks)
Describe 2 methods that the owner of Crafty Crafts could set to make sure that only authorised users can access the data stored on the computer.

Method 1

Name: Using password authentication

Description: The user has a password that is compared to those on file in a database of authorized users' information on a local operating system or within an authentication server

Method 2

Name: Encryption

Description: Scramble the data as it is being stored so that only people with the decrypting key can view the clear text.

b. (3 marks)
The owner of Crafty Crafts wants his employees to have ICT ethics.

i) Define the term **ethics**.

The set of moral principles that regulate the use of computers and the behaviour of computer users

ii) One of the employee's copied a friend's Microsoft Excel program, then suggested to the owner to copy it onto the business computer. What is the problem with the owner doing this?

The owner would be installing a pirated copy of the software (illegal copy of the software). This is against the law.

iii) What is the problem with the employee suggesting to copy the program?

This is unethical of the employee.

Question 21 **(24 marks)**

A recent dramatic growth in Crafty Crafts business has led the owner to review his current system for tracking and re-ordering items. You have observed:

When a customer buys items, the process to record the sale details are:

The customer indicates the required items

The owner uses the stock list to get the item price, calculates the total cost of the sale and then tells the customer the total cost.

The customer pays for the items and a tax invoice is given to the customer. A copy of the tax invoice is placed in the sold items file.

The owner adjusts the item quantity of the item on the stock list.

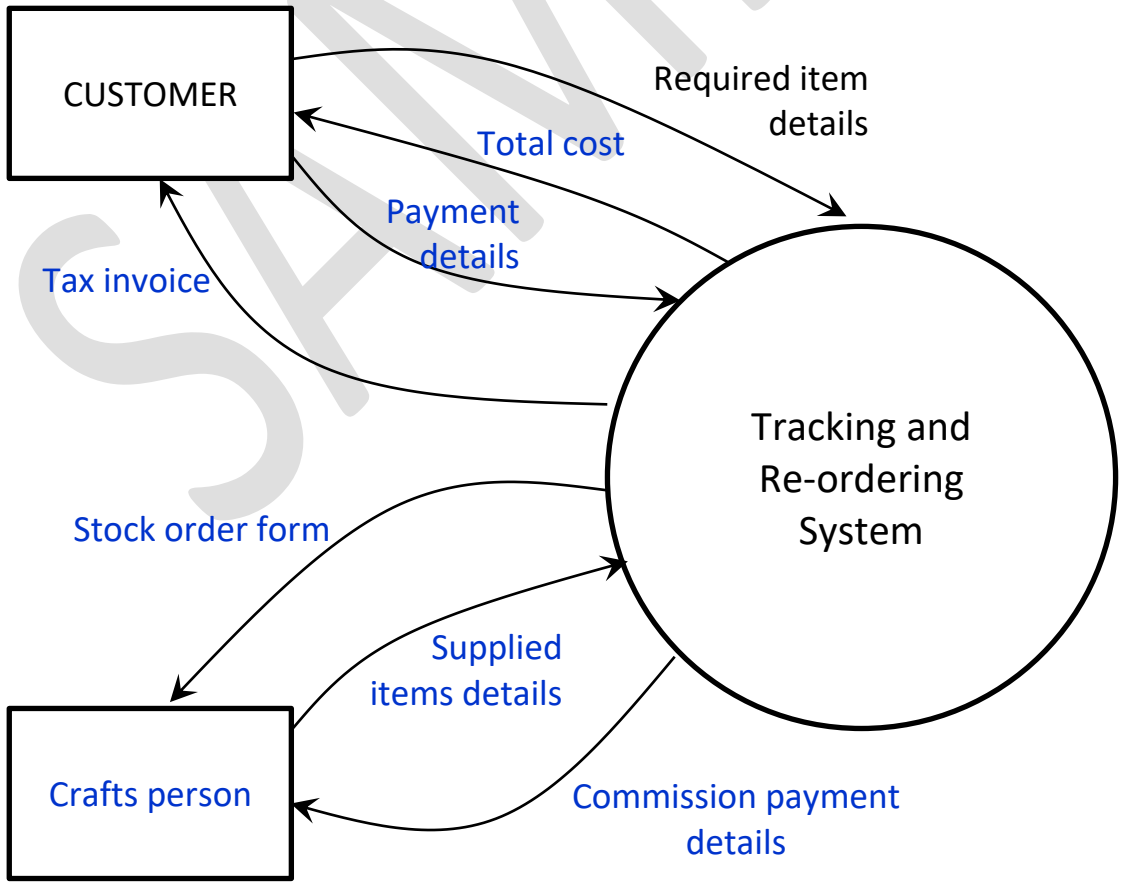
Once a week the manager uses the item quantities listed on the stock list to determine which items need to be ordered. These are recorded on the stock order form which is sent to the crafts person. A stock order form copy is filed into the pending orders file.

When the crafts person supplies the items, the owner uses his stock order form copy to tick off each received item and then updates the quantity of items on the stock list.

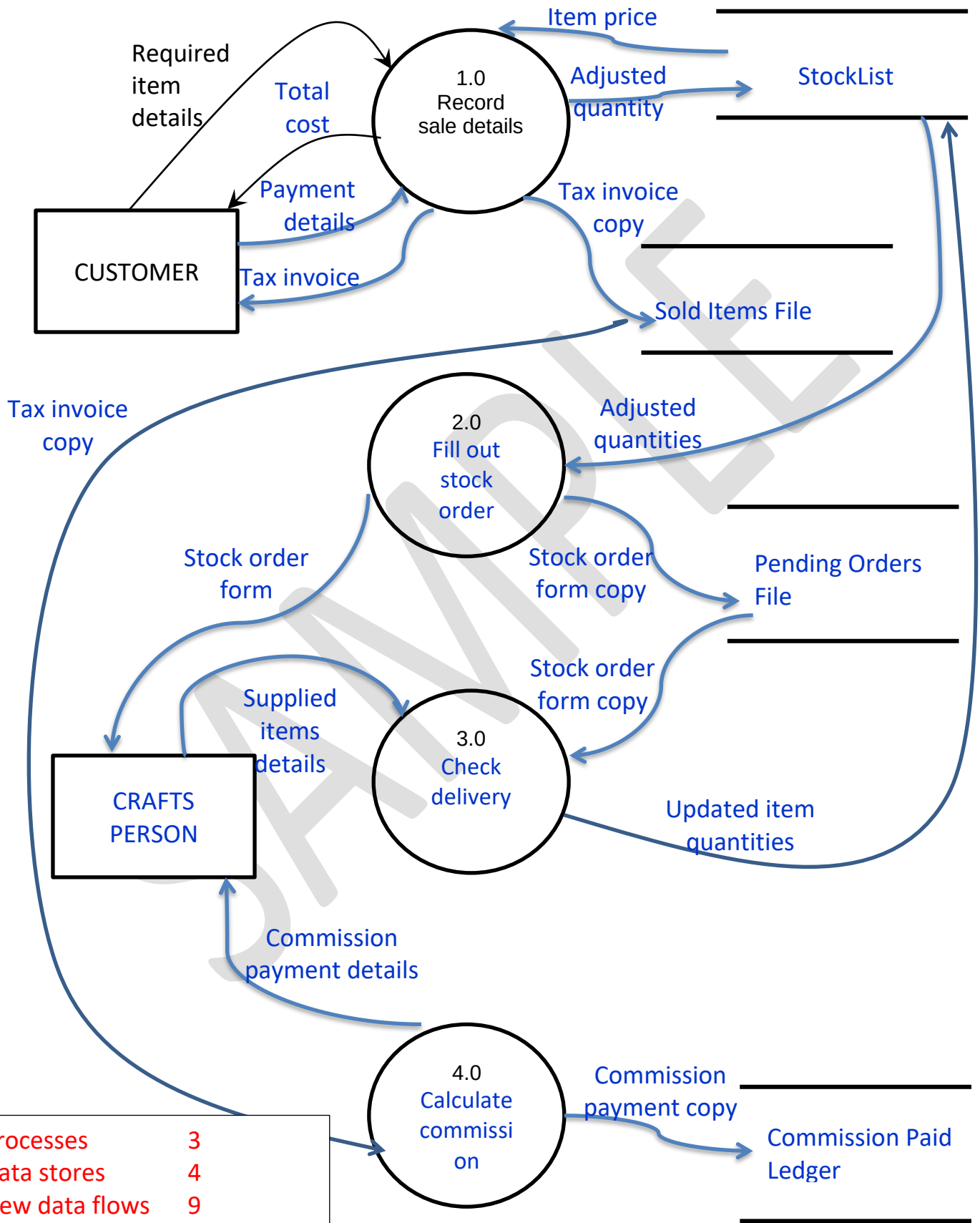
Once a month, the manager uses the copies of the tax invoice to calculate the amount of commission earned by each crafts person. He writes the cheques and sends the commission payment to each sales person. A copy of the commission payment is entered into the Commission Paid ledger.

a. (7 marks)

Complete the context diagram for the tracking and re-ordering system.



b. (17 marks)
Complete the Level 0 data flow diagram below for the tracking and re-ordering system.



Processes	3
Data stores	4
New data flows	9
Match context	1
TOTAL	**17**

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Question 22 (17 marks)

Use the spread-sheet diagram below to answer the following questions.

	A	B	C	D	E	F	G	H	I	J	K
1	**Crafty Crafts Customer Tax Invoice**					**Invoice num**	123				
2											
3	**ItemCode**	**Item Name**	**Unit Cost**	**Quantity**	**Item Total**	**GST Payable**	**GST Total**		**Commission Rate**	**Commission**	**Crafts person**
4	8	Wooden train set	$ 60.00	2	$ 120.00	$ 12.00	$ 132.00		20%	$ 24.00	Kai Lee
5	7	Wooden book marks	$ 5.00	10	$ 50.00	$ 5.00	$ 55.00		20%	$ 10.00	Fred Jakamarra
6	1	Ceramic coffe cup	$ 15.00	4	$ 60.00	$ 6.00	$ 66.00		10%	$ 6.00	Sally Jones
7											
8											
9											
10						**Total Cost**	$ 253.00				
11											
12											
13	**GSTRate**										
14	10%										
15											
16				**Stock List**							
17	**Item Code**	**Item name**	**Unit Cost**	**Quantity in stock**	**Commission rate**	**Crafts person**	**Re-order**				
18	1	Ceramic coffe cup	$ 15.00	29	10%	Sally Jones					
19	2	Ceramic casserole (smal	$ 6.00	2	15%	Sally Jones	Yes				
20	3	Wooden bookends	$ 35.00	8	25%	Fred Jakamarra					
21	4	Stainless steel wall art	$ 255.00	4	17%	Sam Lee					
22	5	Wooden cheese board	$ 55.00	6	15%	Kai Lee					
23	6	Ceramic wall art	$ 283.00	1	11%	Gail Smith	Yes				
24	7	Wooden book marks	$ 5.00	50	20%	Fred Jakamarra					
25	8	Wooden train set	$ 60.00	3	20%	Kai Lee	Yes				
26	9	Wooden side table	$ 580.00	2	20%	Kai Lee	Yes				
27	10	Stainless birdbath	$ 295.00	7	12%	Sam Lee					

a. (2 marks)
List the steps required to name the shaded area **StockList**.

Select the range A18:F27

Type StockList into the Name box then press Enter to lock in the name

b. (4 marks)
What formulae should be entered into the following cells?

E4 =C4*D4

F4 =E4*A14

G4 =Sum(E4:F4) OR =E4 + F4

G10 =Sum(G4:G6)

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c. (2 marks)
The Re-order column indicates YES if the quantity in stock of that item is less than 4. What formula should be entered into G18?

=if(D18<4, “YES”, “ “)

d. (3 marks)
What formula should be entered into C4 so that it uses a vlookup and the item code entered into A4 to list the unit cost?

=vlookup(A4, StockList, 3)

e. (1 mark)
The craft person gets a commission based on the Item Total. What formula should be entered into J4 so that it uses the commission rate in I4 and the Item Total to calculate the commission earned?

=E4*I4

f. (1 mark)
The customer only needs to see part of the invoice. Explain how it is possible to restrict what is printed so that the customer only gets A1:G10.

Select A1:G10

Choose File → Print → Selection

g. (4 marks)
Give examples of the following spread-sheet elements.

Element	Example
Label	Any of the headings such as A3
Value	D4
Displayed value	C4
Range	A18:F27

End of Section 2

END OF PAPER

Additional working space

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