Answers

1. Amelja has a small, successful chain of supermarkets and is expanding rapidly. She has instructed the architects for her latest store to make it as automatic and efficient as possible by using the latest technology.

(a) The stores will make use of self-service checkouts. These will consist of personal computers with touch screens.

(i) Identify **one** other type of computer that the self-service checkouts will need to communicate with to update stock and retrieve product prices. [1]

Server / database server. (1)

(ii) Explain **two** advantages of the supermarkets using a self-service checkout. [4]  
  
Customers scan their own goods (1), so they don’t need to employ checkout assistants / one assistant can deal with many checkouts. (1)  
There are more likely to be many self-service checkouts available, (1) so customers don’t need to queue as long. (1)  
A self-service checkout does not need communication with an assistant (1) which some customers may prefer due to being on the phone / speaking a foreign language. (1)

(iii) Explain **one** disadvantage of using a supermarket using self-service checkouts. [2]  
  
The checkout replaces many employees (1) which may lead to redundancies. (1)  
It is easier for customers to steal goods (1) without being noticed as they can forget/decide not to scan products. (1) Some customers may feel that a personal touch is lost (1) as no-one is involved in the transactions. (1)

(b) Each supermarket has its own car park with free parking to customers for up to two hours. Amelja is concerned that people could park there for longer than two hours or park there but not use her shop. She doesn’t want to have to employ a car park attendant.  
  
Discuss possible methods that could be used to ensure that only people who use   
the shop obtain free parking of up to two hours. [6]

* ANPR – Automatic Number Plate Recognition. This can read number plates   
  as they enter/exit the car park. If the car has not exited within two hours then the address of the car’s registered keeper can be looked up on the DVLA database. An automated letter with a parking fine can then be sent to the address.
* A barrier can be given on entry and exit. When the car enters, the customer keeps their ticket. This can then be validated by the store so that no charge needs to be paid. A validated ticket can open the exit barrier (or prevent a fine from an ANPR system).
* Customers of the shop may appreciate such systems if it helps them to get a parking space and the system is easy to use.
* If customers forget to validate their ticket, they may get angry if they receive a fine. A process to appeal this would be useful
* The car park must clearly display the rules so that people who stay longer than two hours, don’t inadvertently get fined.

| **Level** | **Mark** | **Descriptor** |
| --- | --- | --- |
| Level 0 | 0 | No rewardable material. |
| Level 1 | 1-2 | Technical vocabulary is used but it is not used appropriately to support arguments, in relation to the issues of the question.  Issues are identified but chains of reasoning are not made, leading to a superficial understanding. |
| Level 2 | 3-4 | Accurate technical vocabulary is used to support arguments but not all arguments are relevant to the issues of the question.  There is consideration of relevant issues using logical chains of reasoning.  Considers the various elements of the question. |
| Level 3 | 5-6 | Fluent and accurate technical vocabulary is used to support arguments that are relevant to the issues of the question.  There is a balanced and wide-ranging consideration of relevant issues, using coherent and logical chains of reasoning that shows a full awareness.  Carefully considers the various elements of the question. |

(c) The supermarket will make use of RFID cards for employees to access staff areas.

(i) State what is meant by RFID. [1]  
  
Radio frequency identification. (1)

(ii) Explain **one** advantage of using RFID cards over a PIN code system. [2]  
  
RFID cards can be touched on a reader so are very fast (1) compared with a   
PIN system where the code must be entered. (1)  
A customer could see a PIN being typed (1) and then enter it to gain   
unauthorised access. (1)  
PINs can be forgotten (1) which denies an employee access. (1)  
A PIN could be shared to people who shouldn’t have access (1) enabling   
them to gain unauthorised access. (1)

(d) The store will make use of digital video cameras and the internet for their security system. Explain **two** advantages of using such a system. [4]  
  
As the video is digital it is less likely to degrade (1) as those that are analogue / stored on tape. (1) By using the internet, the video footage can be stored at a remote location. (1) This will make it difficult for a thief to steal or destroy. (1)  
The cameras could be accessed via the internet (1) to view video from a remote location (in the event of an alarm being triggered / concern). (1)  
One cable can provide both power and network connection (power over ethernet cable). (1) This makes the cable easier to install than an analogue system which may require many cables. (1) [Total 20 marks]