**Hardware Exam Questions**

1. An information system is to be installed in a bus station. There will be a number of terminals for use by passengers who will be able to make enquiries about times of buses and the stops that they will make on the journey. The terminals will be in the open air. The terminals will be networked with a server in the main office.

State a peripheral hardware configuration for this system, giving reasons for your answers.

A peripheral hardware configuration for this system is a single, or multiple touch screens. One touch screen may be used to input information, e.g. a destination, by typing it in on an on screen keyboard. This touch screen acts as both an input and an output device, because it is outputting the keyboard so that the user can see it, but it is also taking in data, as it sends a signal to the processor every time the user clicks a key on the keyboard. Another touch screen, or just a normal monitor, may be used to output more information in a different place, for example on a screen in front of the user, instead of below them, where the other touchscreen would most likely be.

An advantage of a touch screen being used is that it is very cost effective, as once it has been implemented; it does not need much maintenance. This means that it will last a very long time. It is also very durable, so it can withstand bad weather conditions, and extreme temperature conditions, as long as it is properly protected in the first place. It is also fairly hard to be broken or vandalised, and therefore will not have to be replaced as it will not be broken often.

The software that is used on the touchscreen can be very simple, which means that it is easy to understand, and therefore can be used by anyone who wants to find out any information.

Touch screens are also fairly accurate, which means that it is easy to input information, and therefore people can wasily find out the information which they desire.

The information which needs to be accessed may be stored on a hard drive in the server, which is in the main office. This prevents it from damage, as it is much more secure in an office than where the machines are. This timetable information may be backed up to magnetic tape or a CD-RW.

To store the main operating system for the terminal, it will need a small built in hard drive.

**[8]**

1. (a) Explain the meaning of the terms
   1. input device,

It allows us to tell the computer what we want to do, and also allows us to enter raw data into the machine.

(ii) output device.

It shows the results of the computer's processing to the user in some form.

**[2]**

(b) Cashcard machines (ATMs) provide keyboards to allow users to input data.

Computers are often supplied with QWERTY keyboards to allow users to input data.

Discuss the differences between these different types of keyboard, explaining why the differences are necessary.

QWERTY keyboards consist of letters, numbers and symbols, along with many command keys, whereas a numeric keypad only usually consists of numbers and maybe a few control keys, e.g. arrows. A QWERTY keyboard needs a wider input because it is used for much more. This means that it offers more functionality to the user, and so can be used to input more varied types of data and more commands to a machine. They are also usually used with computers, which means that they will need to do a lot more than an ATM keyboard, which only needs to input a small amount of numerical information, e.g. a pin or the amount of money somebody would like to withdraw. This means that it only needs a numerical keypad, and maybe a few buttons to select options on a screen.

QWERTY keyboards are a lot less durable that the keyboards found on ATMs. This is because a QWERTY keyboard found on a computer only needs to be used for home use, and therefore it will be very unlikely that it will be intentionally damages or vandalised, whereas an ATM keyboard will be used by lots of people, and some people may try to break they keyboard, therefore it needs to be a lot more surable in order to maintain functionability.

QWERTY keyboarfd are used indoors, and therefore do not need to be weather resistant, whereas ATMs are sometimes loacted outside, and therefore will need to be weatherproof so that they do not break if they get wet from rain etc.

**[6]**

1. When a company completes a contract, the customer is asked to fill in a data capture form that asks about their satisfaction with aspects of the job.

The intention is that the data on the forms should be input using optical mark reading (OMR) techniques.

(a) State the hardware necessary and describe the input method used if the system is off-line.

The hardware necessary is an OMR reader. The input method used is that the computer can recognise the presence of a mark on the paper by reflecting light onto the paper. The position of the mark on the paper conveys some information to the machine as to what the reply was, which is stored, and repeated for all of the other marks on the sheet.

**[4]**

(b) Explain how the form and its contents are likely to be affected by the need to use OMR.

All of the questions have to be multiple choice, as the computer can not understand handwriting. This means that there is a limit on the type of information that can be collected, as they cannot explain there opinions. Also, the paper can not be folded or smudged, as this will cause the machine to incorrectly read the answers, which will make it inefficient.

**[3]**

1. A shopkeeper uses a stand-alone computer for producing

* Order forms for sending to suppliers.
* Records of sales and purchases as evidence for the taxation authorities.
* Leaflets advertising special offers.

The computer has a hard drive, a CD-RW drive and a DVD drive.

State a different use, by the shopkeeper, for each of these three storage media. In each case say why it is appropriate for that use.

Hard drive - This may be used to store user files. This is because it has a large storage capacity, and it is always available to have information read from and written onto it.

CD-RW - This could be used to back up any information that does not need to be stored on the har drive any more. It is portable, and so can be stored somewhere fairly easily, as it is albo fairly small, and can be used to access data when needed. It can also be written to multiple times.

DVD - This could be used to hold an application, as most applications can be run from a DVD, and therefore it can be transferrd between computers, and so a program can be run anywhere.

**[6]**

1. A firm offers a service to potential customers whereby the firm’s representative calls at the customer’s house and produces an image of what the proposed building improvements will look like.

Explain how this service is carried out. Include a reference to the hardware required.

The representitive will need some type of hardware to take a digital photograph of the house, so probably a digital camea. This photo can be uploaded to laptop, notebook or tablet that the representitive has with them, and loaded into some image maniputation software. This will allow the representitive to edit the image by combining it with other images from other work that they have done that may be similar, so show what the final improvements may look like. This could be emailed to the user so that they have a copy of it.

**[6]**

1. Workers at the plant register when they arrive for work by placing a card in a machine (clocking on) and repeating the process when leaving (clocking off). This machine is not connected to a computer. These cards are then used as input to the payroll program. The data on the cards comprises a bar code and OCR data. Describe how these two types of data are read by the computer and state what they are used for in this application.

Barcode - This is used to identify which person the card belongs to. A laser scanner reads the reflected laser light from a series of dark and light lines of varyin thickness. Pairs of lines of different widths make up a code, which canbe translated into a number, which will relate to a certain employee.

OCR - This records the time that each employee clocked in and out. When an employee clocks in or out, the time is stampped onto their car. The data is read as the OCR reader measures that amountof light reflected to determine the shape of the characters, and it compares them with examples in it's memory. It will then save this information, maybe in a spreadsheet or database, in order to know how long that employee worked for.

**[6]**

1. A supermarket has a number of point of sale (POS) terminals.

State two input devices and one output device that would be found at each POS terminal, describing what they are used for.

One input device which may be found at a POS terminal may be a numeric keyboard. This may be used by the user to input their pin, or by the checkout assistant to enter how much money the user has to pay (if this is not done automatically).

Another input device will be a chip and pin reader. This will read the inormation off of the magnetic chip in the card, and then use this to contact the bank to check that the card in valid, there is enough money in the account etc.

An output device on a POS terminal may be a screen. This will be used to display instructions to the user, telling them when to enter their pin, how much the pament is, when they should remove their card etc.

**[6]**

1. State a sensible use that a office worker could make of:

**(a)** a hard disk,

To store files that they are working on.

**(b)** a rewritable CD (CD-RW),

To backup or archive files that they need to keep, but do not need to access them.

**(c)** a CD-ROM.

To run application off of, for example if a computer does not have a certain application installed, it can be run off of the CD-ROM.

**[3]**

1. When a book is sent to the company by an author, it is sent in hard copy form as well as on a disk. It is read and, if accepted, is then sent electronically to a person called a copy editor. The copy editor reformats the text to make it suitable for publication.

Explain why the original copy of the book is in

(a) hard copy form;

It is sent in hard copy form as it is easier for the reader to read, as they do not need a computer to read it. Also, reading for long periods of time on a computer may become uncomfortable. It also allows them to make physical notes on the book before it is sent as a final copy.

**[2]**

(b) electronic form on a disk.

It is a lot easier to copy something which is an electronic file, because you do not need to type it all out again. Also, it is easier to make any corrections before the final book is published.

**[2]**

1. An examination centre holds data about the candidates at that centre.

The data held is

• 4 digit candidate number

• candidate name

• gender

• date of birth

• number of subjects entered.

There are 200 candidates entered by the centre, the expected size of the file is 7.5 Kbytes.

State a suitable medium for storing a back-up copy of the candidate file, giving a reason for your answer.

CD-RW. This has a far large enough size, and a reasonably fast access time. It can be re-written onto many times, which means that if the data is changed, the backup can be updated.

**[2]**

1. A student has a home computer system.

State what storage devices would be used on a home computer system and justify the need for each one.

Hard drive - To store files, as it has a fast access time and can be changed multiple times.

CD/DVD - RW - This would allow the user to backup any important information, and they can be stored easily as they are small and portable.

USB - This can be used to transport any files which are currently being worked on. They have a large capacity, and a fast access time, and are very small an durable, so are perfect for carrying around files that need to be worked on in different places, such as at home and at school.

External SSD - This can be used to store large files, for example photos and videos, so that they do not take up lots of space on the hard drive. SSDs have a fast access time, so the photos and videas can be accessed when they are needed.

**(8)**

1. A department store decides to place a computer system by the main entrance to the store so that customers can find out whereabouts in the store items are available. The different departments remain in the same places, but the articles available in each department change on a regular basis. State a sensible hardware design for such a computer system, giving reasons for your choices of hardware.

Firstly, you would need a screen, probably a touchscreen, in order to output information to the user, and to allow then to unput what they want. In this case, you would need to output a map of the store, and they would need to input the product(s) that they would like to find. If the store was in a particularly bad neighbourhood, they a normal screen an keyboard may be considered, as you can make them more durable and resiliant to vandalism. To store the operating system of the machine, you would need a hard drive. The information that the computer system provides should be stored on a removable storage devide, like a memory card. These have reasonably fast access times, and also can be removed from the system and updated when articles availabble in each department change. Another way to combat this issue would be to create some software which allows the information to be edited on the machine, after an administrative password is entered. This means that the machine does not have to be unlocked to remove te memory card every time, especially if only one small change is being made. It may be better to have both of these options so that if only one change needs to be made, then the machine does not need to be unlocked physically, and a password can just be entered and one change made swiftly.

**(6)**

1. **a)** State two methods of data entry used by banks in their cheque system.

MICR

OCR

**(2)**

**b)** Explain why banks find the use of your two examples suitable for this application.

MICR means that machines can read information like account number and sort code without makin a mistake. It can also be read by humans, so they can see their account nmber and sort code if they need it.

OCR means that it will most likely get all of the information, for example the payee name. It can be read fast by the computer, which means that cheques can be processed efficiently.

**(4)**

1. A company has a workforce of around 2000. Some work in the office using the computer system for administrative tasks, while others use the computer system on the production line for giving details of orders that need to be manufactured.

Select appropriate peripheral hardware for these two application areas, giving reasons for your choices.

In the office, appropriate peripheral hardware may be:

- A monitor, mouse and keyboard. This is all basically needed to input and output and data processed by the computer.

- A hard drive. This would be used to store any files an appliaction that the user needs access to. A central server may also be used for this purpose so that anyone can access their information from any computer connected to the server, provided they have the access rights. This would be more efficient.

- A CD-RW drive. This would be used to back up any information. Magnetic tape may be an alterntive if you sstored all information on a server, as the one server could just be backed up instead.

- Printers. These may be used to print hard copies of any documents that people in the office need copies of.

On the production line, peripheral hardware may be:

-A monitor. This will be used on many of the machines on the production line to see the status of orders.

-Keyboard/mouse. These may be used to control different machinery an input data in order to tell it what to do.

- Manufacturing machines. These will be doing most of the manufacturing, and will be controlled by workers. This is more efficient than getting the workers to do the work themselves.

**(12)**