Peripheral Devices - Homework

You should refer to the **homework policy** for details on how this homework should be submitted.

Attempt all questions.

Question 1

Explain how each of the devices listed below works. Include the main principles of how it works and include simple diagrams to illustrate relevant points. You should aim to have 8-12 points about how each device operates. Your spelling, grammar and punctuation will be assessed in your answers.

1. Barcode reader or scanner (**8 marks**)

A reader is an electronic device for reading bar codes printed on items. Bar codes are sequences of black and white bars that encodes information like the product identifier. Readers consist of a light source, a lens, photoelectric detectors and decoder circuitry that analyses the bar code's image data and generates character codes. The scanner uses the light source to illuminate the black and white lines, then more light is reflected from the white strips so a pattern of reflection is created. This is then converted from optical form to electrical form by photoelectric detectors in the reader. The electrical form of the reflection data is analysed and decoded into character form. The scanner outputs the character codes as a sequence of binary digits for processing by a computer.

2. Smart card reader (**8 marks**)

A smart card is a plastic card the size of a credit card that holds an integrated circuit chip. The chip contains a microprocessor, a small amount of ROM, a small amount of EEPROM, some RAM and a computer bus system with power being supplied by the reader when the card is inserted. Applications used by the card are stored in the ROM and EEPROM, with the EEPROM used to store persistent data while the RAM is used as a scratch pas for temporary data when applications are executed and the microprocessor executes the stored applications. These various forms of volatile memory allow the card to encrypt and decrypt data so that they can be used in transactions that need security.

3. RFID reader (**8 marks**)

Radio frequency identification readers use radio frequencies to transmit data, a timing signal

and energy between a reader and an RFID device. They consist of a: Transponder - located on an object to be identified, Reader - which is able to read data. Due to the two components being independent of each other they do not need to be in physical electrical contact to transfer data, making them useful in shop tags, but they can be powered by radio frequency energy from the reader. An RFID reader is a device that provides the connection between tag data and the enterprise system software that needs information. The reader uses an attached antenna to capture data from tags. It then passes the data to a computer for processing to see the location of the tag and whether it is where it should be or not.

Question 2

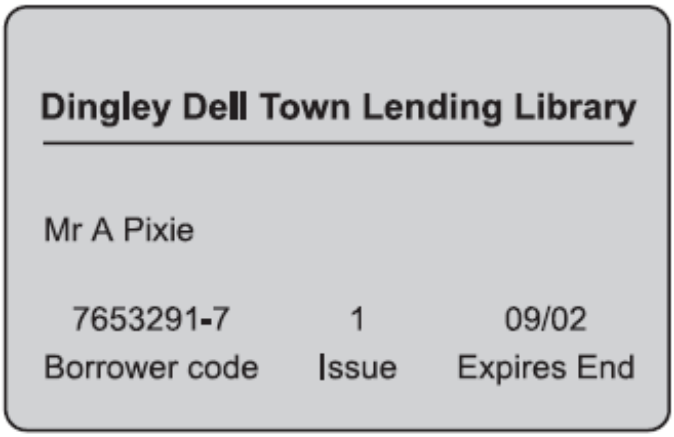
Name the most suitable storage medium for each of the following purposes.

Purpose	**Device**
Backing up a 20Kb file	*CD-RW*
Backing up 1Gb of data	*DVD-RW*
Distributing a software package requiring 400Mb of storage space	*CD-ROM*
Transferring a 30Kb file from one stand-alone computer to another	*USB flash drive*
An online database generated and used in the course of a police investigation of a major crime	*Magnetic hard disk*
Distributing an electronic copy of an encyclopaedia	*CD-R*

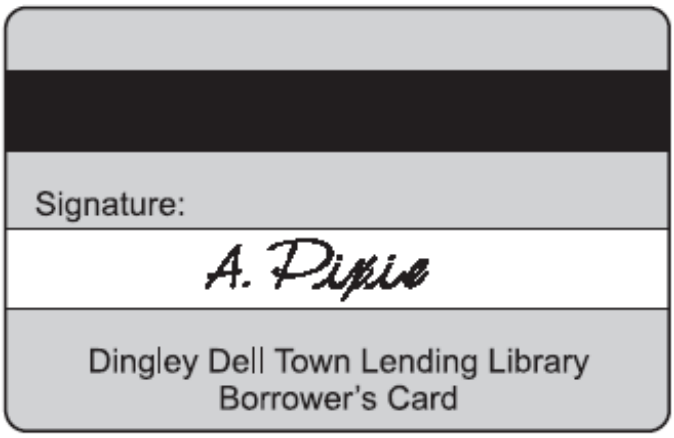
(**6 marks**)

Question 3

A book lending library lends books to borrowers. Each borrower is assigned a unique borrower code. This code is encoded magnetically on to an identity card issued to each borrower when they join the library. The code is read from the identity card by swiping it through a machine connected to the library's computer system. The code is also printed on the card in human-readable form.



Front-side view



Rear-side view

Image url: https://www.dropbox.com/s/sy0jg8i8o86h3kh/Peripheral_hw_qn2.png

Each book is allocated a unique book code. The book code together with other details are pasted on to the inside cover of the book as shown below. When a borrower borrows a book the book code is scanned into the computer system so that the loan can be recorded.

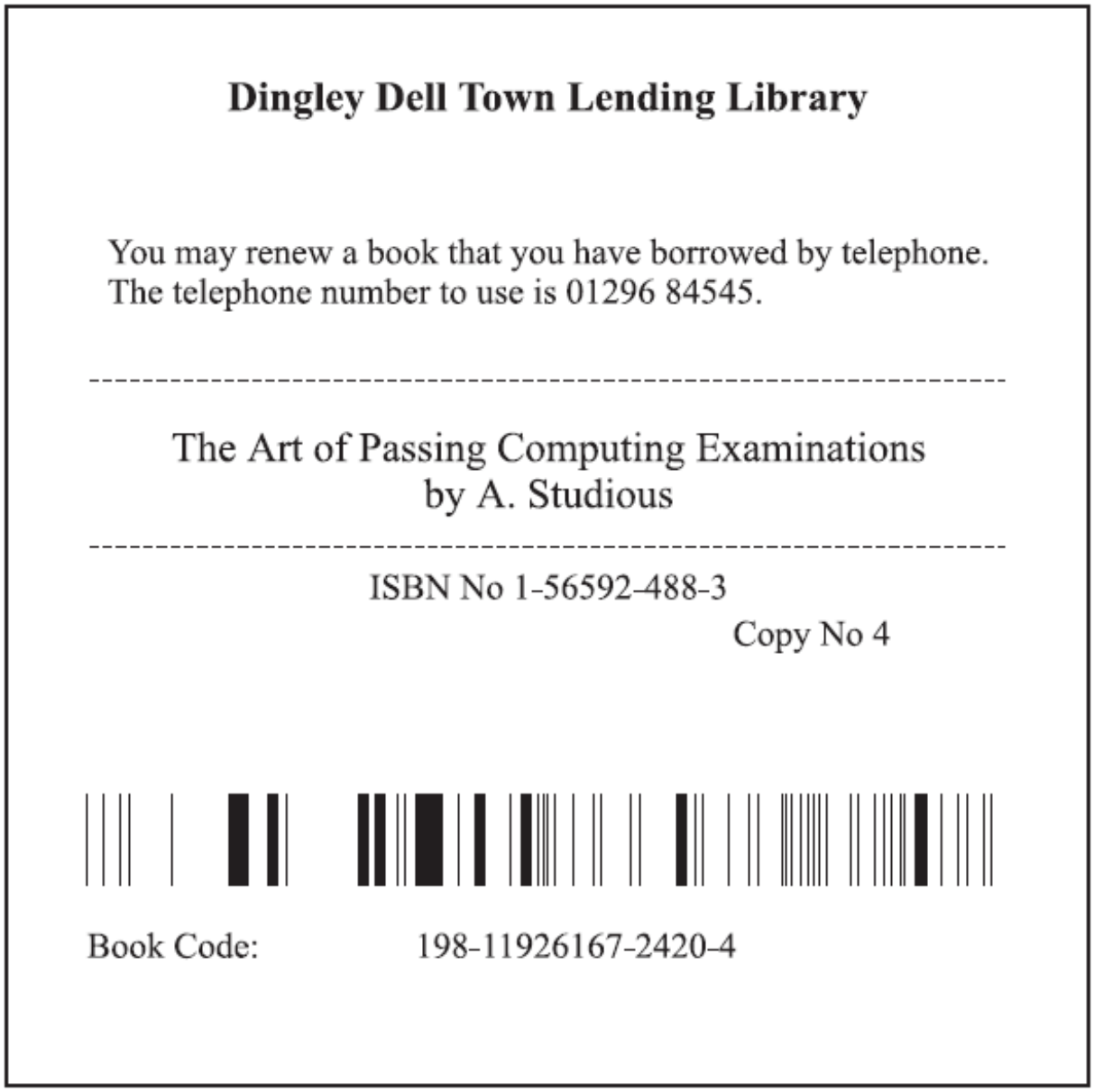


Image url: https://www.dropbox.com/s/1erfbpvxo5uczek/Peripheral_hw_qn2c.png

1. Name the type of machine used to read the *borrower code* from the card. (**1 mark**)

Magnetic strip rader

2. State one reason for having the human-readable form of the *borrower code* printed on the card. (**1 mark**)

So the person can identify what their unique code is in an easier way.

3. Name the device used to scan the *book code* into the computer system. (**1 mark**)

Bar code reader

Question 4

Figure 3 below shows a label removed from an item sold at a supermarket.

Image url: https://www.dropbox.com/s/6blgwt4lhjosbgz/Peripheral_hw_qn3.png

Figure 4 below shows a response form that customers of the supermarket have been asked to complete. The forms are processed using a computer system running a batch operating system.

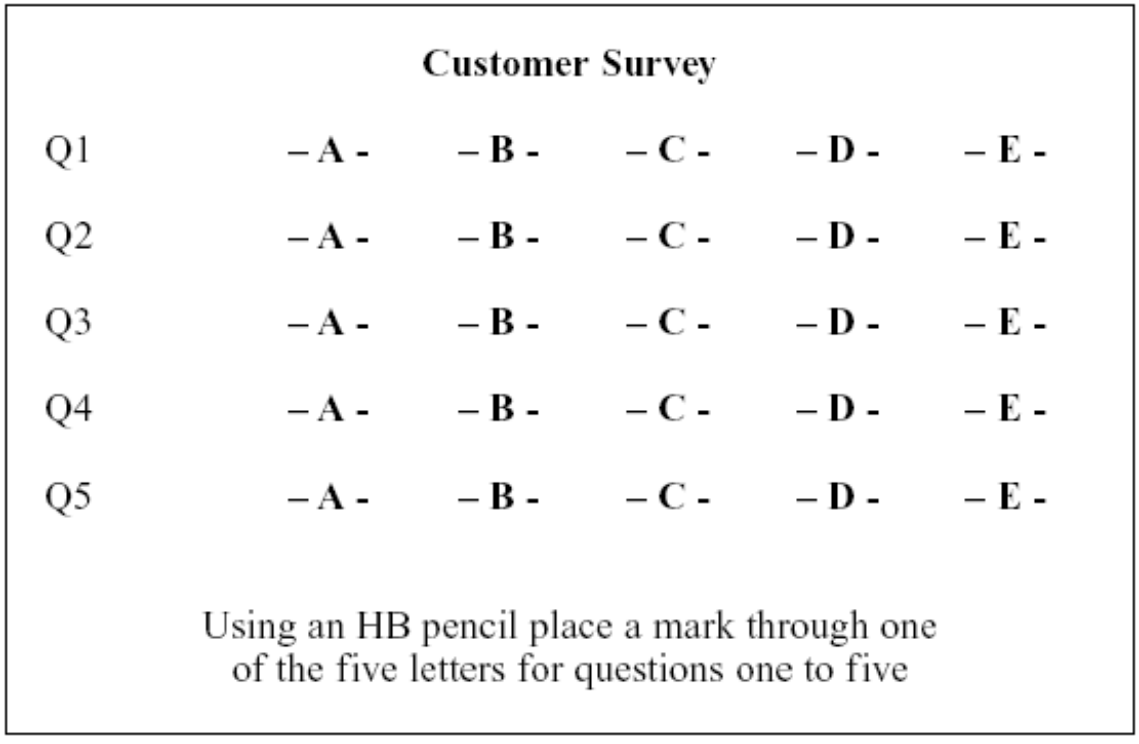


Image url: https://www.dropbox.com/s/deyf1hq6v5whik2/Peripheral_hw_qn3a.png

1. What input device would have been used in the supermarket to read this label? (**1 mark**)

Bar code reader

2. Name the most suitable input device to transfer the data on each survey form into a computer system. (**1 mark**)

Optical mark reader

3. What is a smart card? (**1 mark**)

A smart card is a plastic card that holds an integrated circuit chip that carries out applications that require a certain level of security.

Total 36 marks