Enrichment Points

Q1. What is the difference between barcodes and QR codes?

QR vs. Line Barcodes

QR
- Two-dimensional Barcode or Matrix Barcode
- Can be read horizontally & vertically
- 4,000+ characters of info

Line
- Traditional one-dimensional barcodes
- Can only be read horizontally (1D)
- Only hold a limited amount of data – UPC = 12 digits (#s)
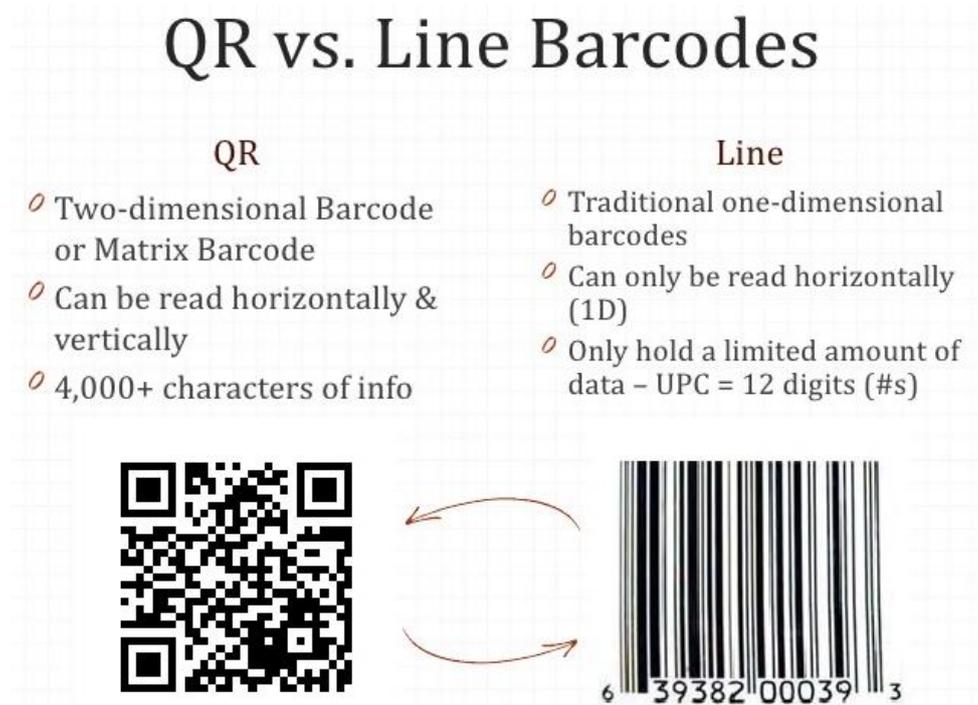
Q2. What is the Quantum Cryptography?
It is a recent technique that can be used to ensure the confidentiality of information transmitted between two parties. Cryptography can be used to ensure that documents or messages remain confidential to all except the person with the key. Cryptography has been used by banks and government for many years. It is also an essential tool for any organisation wishing to trade electronically.

Q3. What is a Cloud Computing?
Cloud computing is where users store their documents, programs and data on the Internet rather than on their own computers. As long as the user has access to an Internet connection, they can create, edit, and share ICT files from almost any location. Because the data and programs are stored remotely, on the Internet, the user will save space on their computer's storage devices.

Q4. What is the function of a firewall?
Prevents computer accessing undesirable/unauthorised sites
Prevents unauthorised computers using the internet accessing the computer
Keeps a list of undesirable sites/IP addresses
Keeps a list of acceptable sites/IP addresses

Malware: Malware is short for malicious software. Malware is the name given to any software that could harm a computer system, interfere with a user's data, or make the computer perform actions without the owner's knowledge or permission.

Spyware: Software designed to collect information about what you are doing on the computer. For example a 'key logger' software. Spyware may be installed without your knowledge by downloading some shareware or other software that does seems to something useful e.g. a free game or utility. Computer security software normally includes an anti-spyware section to help detect these malicious programs.

Keylogger: is a type of spyware that monitors and stores a record of every keystroke made on the computer. This data may then be sent to a remote server without your knowledge. Used to harvest passwords.

Adware: Adware is any software that automatically renders advertisements on websites. These could be pop up adverts or a completely separate webpage could pop up. The objective of an advert is to draw a customer in and to get them to buy the particular item that is on display.

Trojans: type of 'malware' software. A trojan seems to do an useful task and so the user will use it. But in the background, the trojan is also carrying out its real purpose which is hidden and unknown to the user.

A Trojan may:-

- Log all your keystrokes and then send the details to a remote computer / server. Used to capture your passwords
- Allow someone else to take control of your computer whilst you are online.
- Capture screen shots and send them to a remote computer, once again with the intent of obtaining confidential information such as financial screen shots.

Worms: A computer worm is a standalone malware computer program that replicates itself in order to spread to other computers. Often, it uses a computer network to spread itself, relying on security failures on the target computer to access it. Unlike a computer virus, it does not need to attach itself to an existing program.

Browser Hijacker: are spyware programs that take over a part of your browser. For example, they install a search bar that you are unable to get rid of, or they keep changing your home page, so that you can no longer set it to the page of your choice. In the background they record confidential information and pass it on.

Many browser hijackers can be removed using anti-spyware programs. But prevention is better than cure: be alert and critical about what you click and install.

Macro: A macro is a small program, or set of commands, that runs inside another application. They allow you to record and automate procedures that take many steps, and repeat then with a keystroke or the click of a button.

Dongle: a small device able to be connected to and used with a computer, especially to allow access to wireless broadband or use of protected software, and can be used extra level of authentication next to Username and Password.

Augmented Reality:

Augmented reality is a technology that works on computer vision based recognition algorithms to augment sound, video, graphics and other sensor based inputs on real world objects using the camera of your device. It is a good way to render real world information and present it in an interactive way so that virtual elements become part of the real world.

Real-World Examples

- AR applications can become the backbone of the education industry. Apps are being developed which embed text, images, and videos, as well as real–world curriculums.
- Printing and advertising industries are developing apps to display digital content on top of real world magazines.
- With help of AR, travelers can access real-time information of historical places just by pointing their camera viewfinder to subjects.
- AR is helpful in development of translation apps that can interpret text in other languages for you.
- Location based AR apps are major forms of AR apps. Users can access information about nearest places relative to current location. They can get information about places and choose based on user reviews.
- we can involve captured objects or humans taken by a camera in a virtual situation such as fighting game
- If I am looking at a street, for example, and point my smartphone towards that street, it may give me more information, such as names of cafes, gyms, dentists, etc.

Augmented vs. Virtual Reality

Augmented Reality	Virtual Reality
Closer to the real world. It add graphics, sounds & smell to the natural world, as it exists.	Creates immersive, computer generated environments which replaces real world
The user can interact with the real world, and at the same time can see, both the real and virtual world co-existing.	present a view that is under the complete control of the computer.
User is not cut off from the reality	Virtual reality serves for at totally immersive environment .
	The user is completely immersed in an artificial world and cut off from real world.

What is CAD/CAM software?

CAD/CAM stands for computer-aided design & computer-aided manufacturing. CAD/CAM applications are used to both design a product and program manufacturing processes, specifically, { HYPERLINK "https://www.autodesk.com/solutions/cnc-machining-software" }. { HYPERLINK "https://www.autodesk.com/solutions/manufacturing/cam" } uses the models and assemblies created in CAD software to generate tool paths that drive machine tools to turn designs into physical parts. CAD/CAM software is used to design and manufacture prototypes, finished parts, and production runs.

Passive RFID tag vs active RFID tag:

	Active RFID	Passive RFID
Distance	Up to 100 feet	Up to 20 feet
Power Source	Internal- Battery powered	External- Relies on a reader
Cost	Around $20 per tag	.07 - 20 cents per tag
Data Storage	128kb large read/write data	128b small read/write data
Tag Expiration	About 5-10 years, dependant on the battery's life.	Often longer than a lifetime depending on the environment.
Size	Large enough to accommodate the battery. Usually bulky.	As small as a microchip and as large as a paperback book
Advantages	• Reads long distances • Highest data bandwidth • Able to initiate communications • Tag must be replaced when battery dies	• Longer lasting, tag life doesn't depend on battery • Tags are inexpensive • Small tag size accommodates range of assets and is easy to conceal • Tags are more resistant to physical damage or harsh environments
Disadvantages	• Tags are costly • Cannot function without a battery • The tags are large in size, not suitable for smaller assets	• Communication depends on the antenna size and shape • Read range is limited • Difficulty reading through metal or liquid

Contactless payment:

RFID chips are also used in credit cards with contactless payments. When you tap a credit card to pay for something, the machine reads an RFID chip embedded in the card. Also smart watch can be used for contactless payments.

CNC

CNC means **Computer Numerical Control**. This means a computer converts the design produced by Computer Aided Design software (CAD), into numbers. The numbers can be considered to be the coordinates of a graph and they control the movement of the cutter. In this way the computer controls the cutting and shaping of the material.