

MUHAMMAD ARHAM

## GSA- 3<sup>RD</sup> Quarter

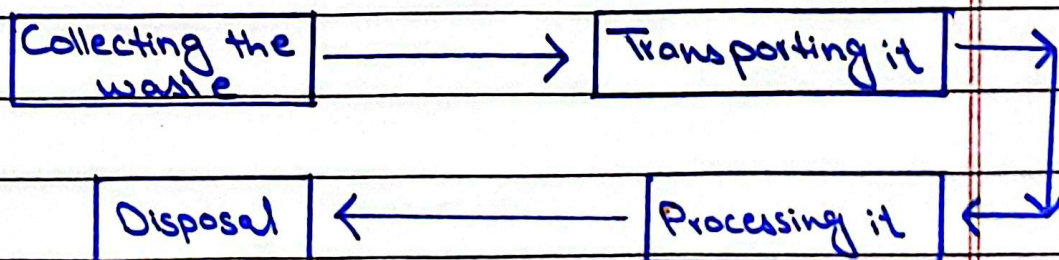
Question no. 1:

Explain the concept of "Solid Waste Management". Describe the advantages and disadvantages of each method.

Answer:

### Solid Waste Management

Solid waste management refers to the system approach to treat the waste products in a well manner. Solid waste management can be done by following some steps.



## Methods and their advantages and disadvantages

(1) Open dumping: Disposing the waste material in an open area without any treatment.

**Advantage:** As such, no advantage but just an easy step to throw waste.

**Disadvantages:** Different viral and bacterial disease take birth, extreme bad odor and harmful for the fresh air inhalation.

(2) Landfills: Waste is buried in a designated area.

**Advantages:** Also easy to throw and fill inside the land.

**Disadvantages:** Pollutes ground water and affects the soil's fertility.

(3) Recycling: Waste materials are processed further to make other useful products.

**Advantages:** Highly recommended method, as much of the waste becomes capable of being used again without

requiring new resources for that specific product, especially plastic.

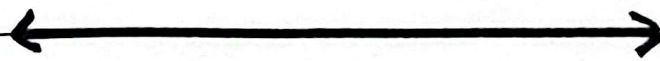
**Disadvantages:** Needs economic attention and proper recycling mechanisms. It is also a costly method.

(4) **Incineration:** Burning of waste at a very high temperature.

**Advantages:** Produces energy through the heat, Reduces the waste amount upto 90%. It is also the main source of energy in Singapore.

**Disadvantages:** Incinerators are expensive as compared to other mechanisms.

Hence, less people tends towards this method.



Question #2:

How can remote sensing and GIS be used to monitor and analyze environmental changes? Give specific examples of their application in environmental sciences?

## Answers:

Remote Sensing and Geographic Information System (GIS) are powerful tools used in environmental science to study and analyze the environmental changes.

## Remote Sensing:

It involves the acquisition of information about an object or ~~the~~ phenomenon without making physical contact with it. This is typically done by the help of satellites.

### Applications:

- 1) Monitoring the land use and the <sup>land</sup> cover change.
- (2) Detecting climate change.
- (3) Widely used in disaster management.
- (4) Monitoring the quality of water.

Examples: It is used to check or monitor the deforestation in any region and to analyze its effects or consequences.

### (iii) Geographic Information System (GIS)

It is designed and used to store, analyze, detect and manage the geographic data. It integrates various data types and provides tools for spatial analysis and visualization.

#### Applications:

- (1) Used in urban planning and development.
- (2) Used in environmental impact assessments.
- (3) Used to check and analyze resources.

**Examples:** It is used by planners to check and analyze the green space i.e. urban places. It helps them to adapt the infrastructure that could be beneficial to build new cities and also to protect the greenery of the urban lands.

Both remote sensing and GIS are two indispensable tools that are used to monitor and manage environmental related changes and also helps them in planning for the disasters and urban resource management.



Question # 3:

What are the main factors that contribute to population growth? Describe the potential environmental impacts of uncontrolled population growth?

Answer:

Population growth sometimes also referred as overpopulation is a burden on the society. It has impacts on environment as well as on resources. Every country is trying to tackle this issue, but it a special case for developing countries.

There are different factors that are contributing to the population growth. Such as:

(1) High birth rate:

Countries with high birth rates are facing this extreme issue, especially newly independent countries such as Pakistan, India, Bangladesh etc.

It is because, at the time of independence they were less than the quarter of their population as of now. Due to the less numbers of old people and more number of new born children they become popular.

### (2) High fertility rate:

Areas that are rich in natural resources have high fertility rates as compared to the other places. The important factors contributing in high fertility rates are the essential minerals, vitamins and enzymes that are provided to them through their soil.

### (3) Immigration:

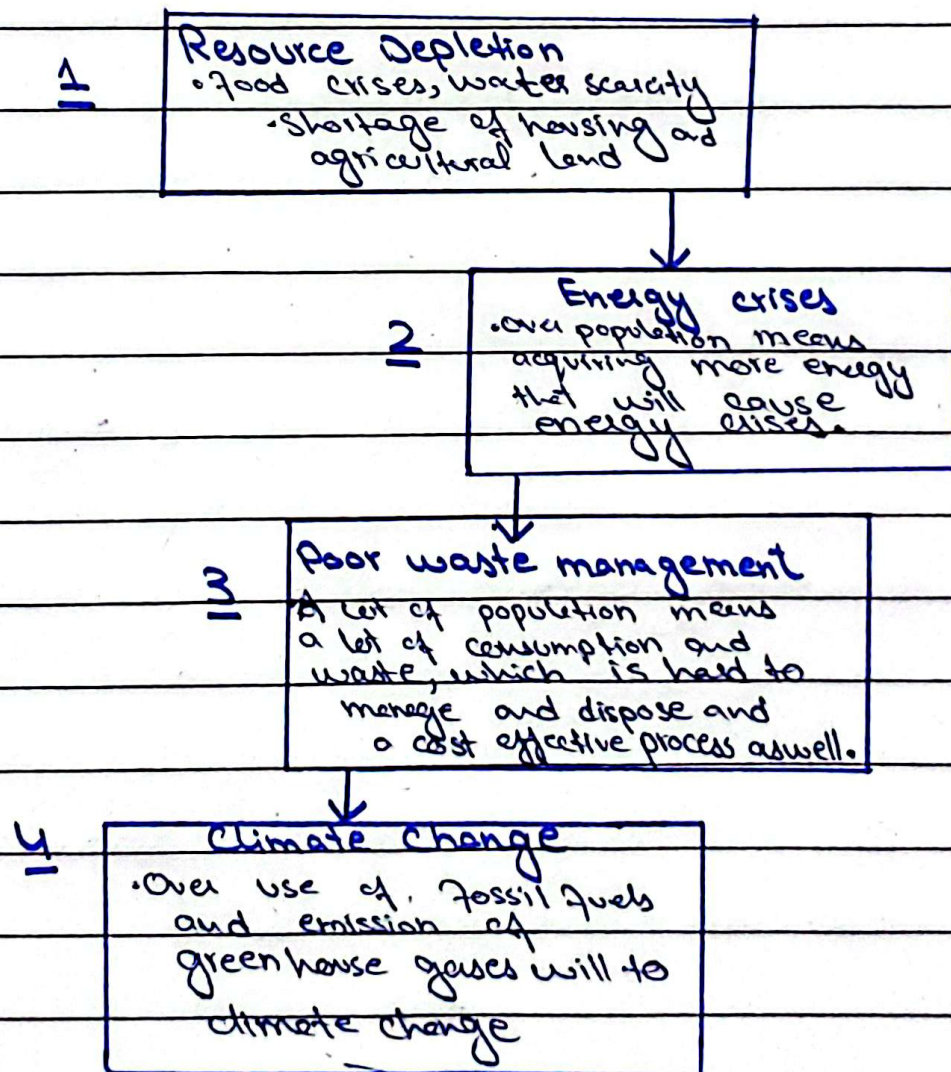
It is the process of migration of people from one area to the other permanently. Countries with high GDP and social services tend to have more immigrants, which puts a burden on their resources and the social sectors.

### (4) Cultural, religion and social factors:

Different cultures, religions and

societies have their own developed definition of population. Many of them favors in large & family circles and also considers it a religious duty. However, later on, this put a great pressure on the economic and financial resources.

## Potential Environmental impacts of uncontrolled population growth.



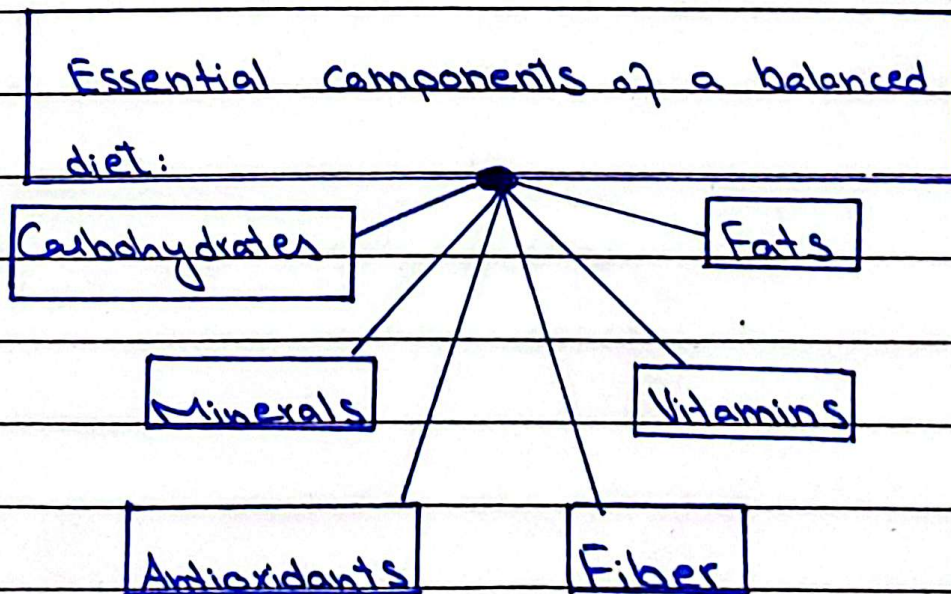


Question #4.

What are essential components of a balanced diet? Briefly describe the role of each component in maintaining good health.

Answer:

A balanced diet consists of all essential nutrients that are required by the body organs to function well. Vegetables, fruits, meat, dairy, nuts and seeds, ~~at~~ have all these natural nutrients which are needed by the body.



## Roles of components:

(1) **Carbohydrates:** They provide the primary energy to body required by the organs for proper functioning. Sources: Whole grains, fruits, vegetables etc.

(2) **Vitamins:** They are the essential macro-nutrients required by the body. There are two types of vitamins: Fat-soluble and water soluble. Both are required by the body. They help in good vision, making bones strong, increasing quality of blood, strong teeth, strong hair, wound healings etc.

Some prominent sources of vitamins are:

Fresh fruits, citrus fruits, beans, nuts, dairy product and green leafy vegetables.

(3) **Fats:** It helps in providing energy and supports the growth of cell. It also helps in digesting fat soluble vitamins A, D, E and K.

• Sources of fat are fatty fish, fishoil, red meat, nuts and unsaturated dairy products.

(4) **Minerals:** They are inorganic substances that helps the body in making strong bones, muscle growth and in nerves functions.

Sources of minerals include; salmon fish, dairy products, meat, seafood etc.

(5) **Fiber:** It is an essential nutrient that is usually undigestible by the body. It helps in making the immune system strong and to exhibit the toxic substances out of body through stools.

Sources of fiber includes, leafy green vegetables, some fruits and whole grains.

(6) **Antioxidants:** They prevents the cell from harmful substances and produces free radicals, which helps and prevents

the body against chronic diseases such as heart attacks, type-2 diabetes and even cancer.

- Some sources of antioxidants are berries, vegetables, and seeds.



### Question # 5:

Explain the concept of 'bio-availability' of nutrients. How can food processing and preparation effects the bio-availability of nutrients?

### Answer:

#### Bio-availability of nutrients

Bio availability of nutrients refers to the proportion of a nutrient that is absorbed from the diet and made available when needed by the body. Several factors determine the bio-availability, such as nutrient form, presence of other compounds in food, health of the person, age, sex and daily routine.

## Impact of food processing and preparation on Bio-availability.

(1) **Cooking:** Cooking can break down the cell walls in plant foods, making it more nutrient. For example, after being cooked tomatoes increases the bio-availability of lycopene. Similarly milk is also boiled to kill its germs. Alcohol can destroy anti-nutrients that are not beneficial for human health.

(2) **Fermentation:** It increase the bio-availability of certain nutrients in the food by breaking down the anti-nutritional factors and increases the availability of vitamins like B12 and K2.

(3) **Grinding and Milling:** Grinding and milling grains increases their bio-availability of nutrients and make them more accessible.

(4) **Soaking:** Soaking seeds and legumes

specially in water, enhances their bio-availability of nutrients such as zinc, iron and potassium. This also removes the anti-nutrient factors.

(5) Storage: Some food items are stored to use later. For this purpose, usually food is held in tight air jar or box to keep it protect from the bacteria. Sometimes, salt is also used to store and preserve food for long time. For example, salting the meat to protect it from outside bacteria.

### Negative impacts:

- Too much heating or cooking can spoil the sensitive nutrients, such as vitamin-B and vitamin-C.

- Refined the whole grain can loses its fiber quantity, vitamins, minerals and lowering the overall nutrients.

- Some food additives and preservatives may interact with food, sweeping away its nutrients.



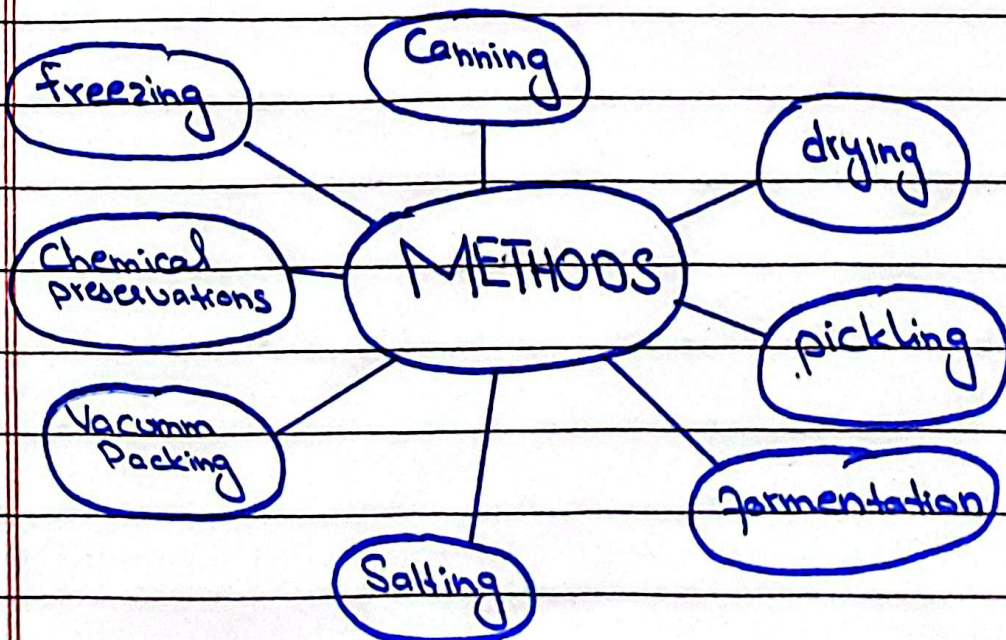
## Question # 6:

Describe the different methods of food preservation and explain how they help to prevent food deterioration?

## Answer:

Food preservation is the method to target the specific microbial activities in the food to extend the shelf life of food and to prevent it from spoilage.

## Methods of Food Preservation



(1) **Freezing:** Lowering the temperature of the food to stop the microbiological reaction of microbes. In this process temperature is decreased to  $-18^{\circ}\text{C}$  ( $0^{\circ}\text{F}$ ).

(2) **Canning:** It is the process of storing food in any air tight jar or can to prevent the food from the outer environment in order to curb the microorganisms and their activities.

(3) **Drying:** Also called dehydration, it is process of removing the moist from the food. It slows down the enzymes activity to spoil the food.

(4) **Pickling:** It is the process of adding some acidic material to prevent the food and to use it for a long time. In this method, usually vegetables are used with vinegar, and sometimes with mustard oil along with spices.

(5) **Salting:** In most of the food items, specially meat and fish, salts are used to preserve them. Salting helps in extracting the water from the food, hence acts as a barrier between the



microorganisms and water.

(6) **Fermentation:** It is the process of using beneficial microorganisms to convert the state of the food, that can also be consumable. For example, fermentation of milk into yogurt.

(7) **Vacuum Packing:** In this method, the food is preserved in an empty package by removing all the oxygen inside that package. This helps the preservation of food by stopping the microbial growth and oxidation.

(8) **Chemical Preservation:** Some antioxidants, antimicrobials and other preservatives are added to the food to extend its life, and to stop the growth and reaction of microorganisms.

→ How they help to prevent the food deterioration?

Food deterioration refers to the degradation of the food quality with the passage of time.

However, preservation methods help to

maintain the quality and quantity of food. Preserving the food items through proper methods helps the food to remain safe against microorganisms and any kind of enzyme activity. Hence, food can be used anytime.



Question no 7:

Compare and contrast the functions of Hardware and software in a computer system. Give examples of Each.

Answer:

→ Hardware: Physical parts of a computer, we can touch and feel. They are used for basic functions in the computer. They include both input and output devices.

→ Software: It is a set of programs used by the computer to do different operations. They are responsible for holding data and information and have no

Physical appearance.

## Comparison

### Hardware

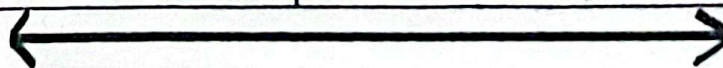
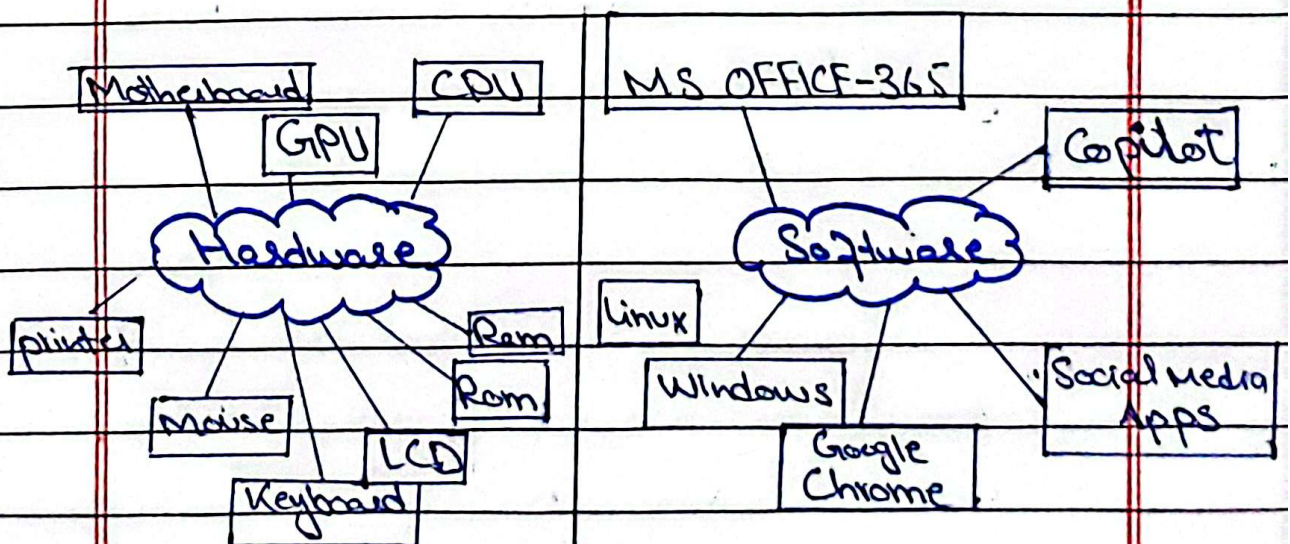
### Software

	<u>Hardware</u>	<u>Software</u>
(1) <u>Physical presence</u>	Each and every physical part of a computer system.	A set of instructions and codes, hence not present physically.
(2) <u>Function</u>	Perform physical operations and data processing	Process information and convert it into readable forms
(3) <u>Interaction</u>	Can be touched physically.	Can not be touched physically.
(4) <u>Failure of components</u>	Needs to be repaired or replaced.	Uninstall and reinstall. Moreover, error scanning can also help.
(5) <u>Upgradation</u>	Costly and needs to replace the part.	A simple update or a new version can help.
(6) <u>Availability</u>	Parts are usually bought by visiting stores or even online. Moreover, it's a hectic process	Can simply be downloaded and then installed from internet without any hassle

## Contrast

	Hardware	Software
1) Nature of existence	Present in physical form and in tangible form.	It is intangible and is present inside the computer as being a program.
2) Dependency	Can exist without software but cannot perform any function.	It depends upon hardware to operate.
3) Maintenance	Requires physical maintenance and updation.	Requires online updates and scanning to fix the issue.

## Examples



### Question #8:

Explain the basic principles of networking and the role of internet standards in facilitating communication.

### Answer:

A networking is a collection of system, connected together to share data, information and programs. There are different types of networks. Such as, LAN, WAN, MAN and PAN.

### Principles of Networking

The principles of networking refers to the ways through which computers are connected together and communicate. These principles include:

1) Communication Model: One computer as a server device while other receiving computers are clients, who takes data from the server.

2) Protocols: These are the assigned rules through which computers communicate.

Internet Protocol (IP) is used by each

computer to connect with the other.

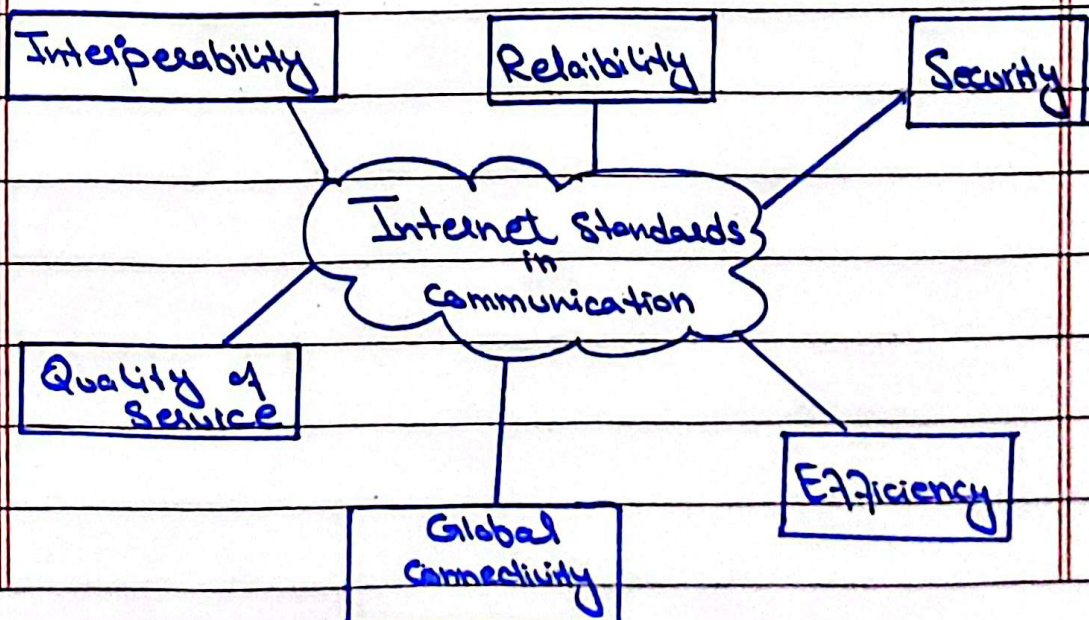
This IP is a unique numeric code, assigned to a device for networking.

(3) **Topologies:** These are pattern, through which devices are connected. They include: Ring topology, Bus topology, Mesh topology, Hybrid topology, Star topology and Tree topology.

(4) **Routing:** They determine the best path for the transfer of data.

In routing, routers are used which helps the computer to send and receive information.

### Role of Internet standards in facilitating communication.



(1) **Interoperability:** Defines that different hardware and softwares can work together to form a network and to communicate.

(2) **Reliability:** Standards provide ease in connectivity through internet.

(3) **Security:** Each device has a unique IP which makes him secure throughout the networking process.

(4) **Efficiency:** The standards of internet makes the networking process much efficient and faster.

(5) **Global Connectivity:** Through internet millions of devices are capable to form a network and to communicate, irrespective of their area, city or country.

(6) **Quality of Services:** Internet standards ensures the quality of services to remain best. From a text message to downloading a big files, it provides the best quality of service.



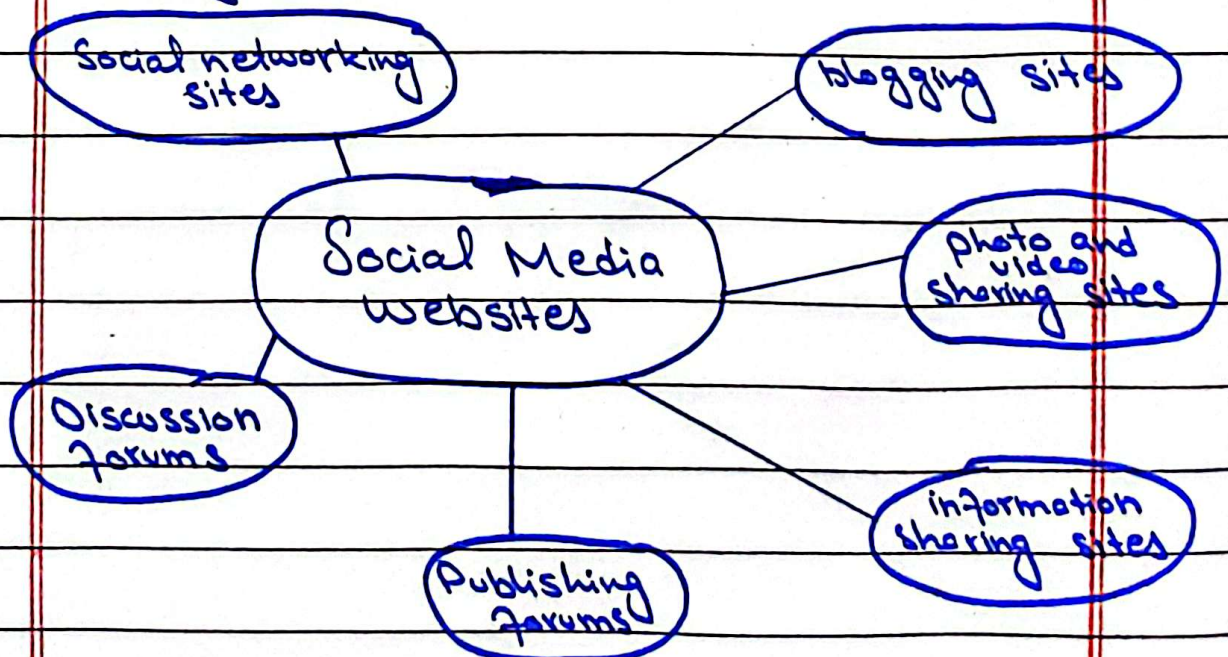
Question # 9:

Describe the different types of social media websites and discuss their potential impact on society.

Ans:

Social media websites usually used for peer to peer interactions.

They are operated usually through internet and are widely used to share information, pictures, videos, text messages and audio vide calls. Almost every internet user has social media accounts for interaction to the world.

Types of Social media websites.



1) Social networking websites: These are the website on which people socialize and interact with each other <sup>through calls, texts and video calls</sup>.  
Example: Facebook, Twitter, Tagged, whatsapp etc

(2) Blogging websites: These are websites where people upload their blogs and articles. For example: Google-Blogs etc

(3) Photos and videos sharing websites: In this type of websites, people usually send and receive photos and video through internet. For example: Instagram, Snapchat etc.

(4) Information sharing websites: These websites on which information regarding different topics is shared are called information sharing websites. These include: Wikipedia, Britannica, Quora etc

(5) Publishing forums: These are the website on which articles, journals, news ~~and~~ updates, magazines etc are published.  
For example: Dawn, BBC, Al-Jazeera etc.

(6) Discussion Forums: These are the platforms that are usually used for educational purposes. On which, people present their views in the form of text, voice or even video.

For example: Reddit, Quora, Youtube live etc.

(7) Professional networking websites: Such type of websites are used for professional purposes, such as seeking job or even seek looking for an employee.

For example: LinkedIn, Indeed etc.



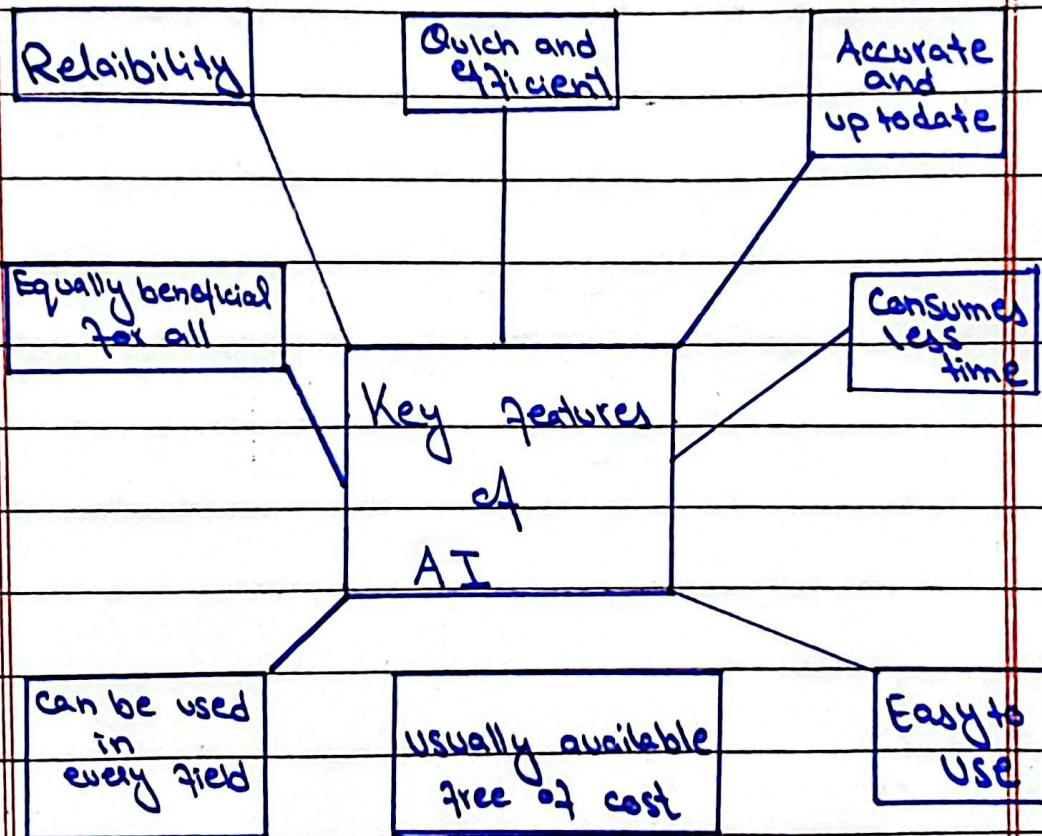
### Question # 10:

What are the key features of AI? Briefly explain how AI is being used in different fields and discuss its potential benefits and risks.

### Answer:

Artificial Intelligence (AI) is the most recent and advanced revolution in the history of computers and

networking. The concept of AI was driven out after the WWII and the invention of modern computers. AI is a machine learning program that operates and performs task same like humans and understands the human languages.



→ Applications of AI in different fields

1) Medical: From identification to diagnosis, AI have the ability to provide all necessary information.

(2) **Engineering:** AI help in making the effective parts of machine till the assemble of the machine.

(3) **Education:** A variety of applications of AI are designed for educational purposes. They provide all information and data related to the input within few seconds.

(4) **Cyber security:** AI helps in providing basic framework that can help in building cyber security.

(5) **Electronic gadgets:** AI can help in almost every thing, their presence in mobile phones, washing machines, ovens, AC's, TVs etc are a proof of that.

→ Risks and benefits of AI:

