Cloud Computing

- Cloud computing is the delivery of computing services over the Internet, including servers, storage, databases, networking, software, analytics, and intelligence.
- It is a way for individuals and businesses to use technology without having to manage the underlying infrastructure.

Services of Cloud computing

Types of Cloud Computing

Examples of Cloud Computing

Benefits of Cloud Computing

Limitations of Cloud Computing

Services of Cloud Computing

Cloud services are divided into three categories:

I. **Infrastructure as a Service (IaaS),**
II. **Platform as a Service (PaaS), and**
III. **Software as a Service (SaaS).**

Services of Cloud Computing

- **IaaS** provides virtualized computing resources such as servers, storage, and networking.
- **PaaS** provides a platform for developing, testing, and deploying applications.
- **SaaS** provides software applications that can be accessed over the Internet.

Examples of Cloud Computing

- Examples of cloud computing include web hosting, online storage, streaming media services, software as a service, and virtual desktops.
- These services are usually provided on a pay-as-you-go basis, allowing users to pay only for the resources they use.

Types of Cloud Computing

Three different types of cloud computing:

I. **Public Cloud**
II. **Private Cloud**
III. **Hybrid Cloud**

I. Public Cloud

- In this , the infrastructure and services are owned and operated by a third-party provider and made available to the public over the internet.
- Users can access the resources and services on a pay-per-use or subscription basis, and do not need to invest in and maintain their own infrastructure.

Examples of public cloud providers include Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform.

II. Private Cloud

- In this, the infrastructure and services are dedicated to a single organization and not made available to the public.
- The organization has full control over the infrastructure and can customize it to meet their specific needs.
- Private clouds can be implemented on-premises, using the organization's own data centre, or off-premises, using a third-party provider's infrastructure.
- Private clouds provide more control, security and compliance than public clouds and are typically used by organizations with sensitive data or regulatory requirements.

III. Hybrid Cloud

- It combines a public cloud and a private cloud, allowing an organization to use the best features of both.
- The organization can use the public cloud for non-sensitive workloads, such as web servers or test environments, and the private cloud for sensitive workloads, such as databases or financial applications.
- It takes advantage of the cost savings and scalability of the public cloud, while maintaining control and security of sensitive data in the private cloud.
- The organization can also use the public cloud for burst capacity during peak usage, and the private cloud for steady state workloads.

Benefits of Cloud Computing

- The primary benefits of cloud computing are ***scalability***, ***cost savings***, ***and convenience***.
- **Scalability** allows users to quickly and easily scale up or down depending on their needs.
- **Cost savings** come from the ability to pay only for the resources used.
- **Convenience** comes from having access to cloud services from any location with an Internet connection.

Limitations of Cloud Computing

- The primary limitations of cloud computing include ***security, privacy, and availability***.
- **Security** concerns arise from the potential for data breaches and unauthorized access.
- **Privacy** concerns arise from the potential for data to be shared or sold.
- **Availability** concerns arise from the reliance on the Internet and the potential for outages.

Questions:

1. Write technical terms:

a. Networked computing facilities providing remote data storage and processing services via the Internet.

b. The type of cloud services which provide environments required to run the application over it.

c. The type of cloud services which is directly used by end users (targeted customer) like office 365, iCloud, google docs etc.

d. This type of cloud services lease its virtualized computing resources like servers, storage, and networking devices and services etc.

2. Write full forms : a. AWS b. SaaS c. IBM d. IaaS e. PaaS

3. Write answer:

a. Define cloud computing. List four cloud service provider.

b. Explain two advantages of cloud computing.

c. Write short notes on different types of cloud services.

d. Difference between public cloud and private cloud.

e. Explain two challenges of cloud computing.

What is VR?

Virtual reality (VR) is a computer-generated simulation of a 3D environment that can be interacted with using specialized equipment, such as a headset with a screen and hand controllers.

What is goal of VR?

The goal of VR is to create a sense of immersion in the simulated environment, allowing the user to feel as if they are physically present in it.

Where is VR used?

VR technology is commonly used in video games, training simulations, and other applications that require a user to visualize and interact with virtual objects and environments.

Write any two examples of VR.

Some examples of VR technology and applications include:

Gaming: Many video games now include VR support, allowing players to fully immerse themselves in the game world and interact with it using specialized controllers.

Training and simulation: VR is used in a variety of fields, such as the military, healthcare, and architecture to train personnel and simulate real-world scenarios.

Therapeutic uses: VR is being used as a form of therapy for conditions such as PTSD (Post Traumatic Stress Disorder), phobias, and chronic pain.

Education: VR is used in educational settings to provide students with immersive experiences and simulations that would be difficult or impossible to replicate in the real world.

What is e-governance?

E-governance, or electronic governance, refers to the use of technology to improve the efficiency, transparency, and accountability of government operations. Stake holders like citizen, business and employee gets the government facility through the Internet.

Why e-governance is important?
It encompasses a wide range of activities, including the use of information and communication technologies (ICT) to deliver government services, manage government resources, and engage with citizens.

How e-governance delivers its services?
E-governance can include things like online portals (Like websites) for accessing government services, digital systems for managing government records, and tools for citizen participation in government decision-making.

Write examples of e-governance services in Nepal.
Examples of e-governance services include online tax filing, online passport, vehicle license systems, online tracking of government schemes and welfare benefits, online issuance of various certificates like birth, marriage, and death, online public procurement system, and many more.

Types of e-governance

There are several different types of e-governance, which can be broadly classified into four categories:

Government-to-Citizen (G2C): This type of e-governance refers to the use of technology to deliver government services to citizens. This can include online portals for accessing government services, digital systems for managing government records, and tools for citizen participation in government decision-making. Examples of G2C e-governance services include online tax filing, online voting systems, online tracking of government schemes and welfare benefits, and online issuance of various certificates like birth, marriage, and death.

Government-to-Business (G2B): This type of e-governance refers to the use of technology to improve interactions and transactions between government and businesses. This can include online portals for businesses to access government services, digital systems for managing government procurement, and tools for businesses to participate in government decision-making. Examples of G2B e-governance services include online business registration, online tax filing for businesses, and online public procurement system.

Government-to-Government (G2G): This type of e-governance refers to the use of technology to improve interactions and transactions between different levels of government or different government agencies. This can include digital systems for managing government resources, tools for government agencies to collaborate on policy-making, and systems for sharing information between different levels of government. Examples of G2G e-governance services include online systems for sharing information between different levels of government, digital systems for managing government resources and tools for government agencies to collaborate on policy-making.

Government-to-Employees (G2E): This type of e-governance refers to the use of technology to improve interactions and transactions between government and its own employees. This can include digital systems for managing employee records, tools for employee participation in government decision-making and systems for sharing information within government agencies.

Overall, e-governance has the potential to make government more efficient, effective, and responsive to citizens' needs, by leveraging technology to improve communication, collaboration, and service delivery.

Benefits of e-governance

There are several benefits of e-governance, including:

Improved efficiency and transparency: E-governance can help streamline government operations and reduce bureaucracy by automating processes

and eliminating the need for paper-based systems. This can also increase transparency by making government operations more easily accessible to citizens.

Increased citizen engagement: E-governance can provide citizens with more opportunities to participate in government decision-making and access government services. This can include online voting systems, online portals for accessing government services, and tools for citizen feedback and participation in policy-making.

Increased accessibility: E-governance can make it easier for citizens, especially those in remote or underserved areas, to access government services. This can include online portals for accessing government services and digital systems for managing government records.

Cost savings: E-governance can help reduce the costs associated with government operations by automating processes and eliminating the need for paper-based systems. This can also reduce the costs associated with providing government services to citizens.

Better decision making: E-governance can help government agencies make more informed decisions by providing them with easy access to accurate and up-to-date information.
Overall, e-governance has the potential to make government more efficient, effective, and responsive to citizens' needs, by leveraging technology to improve communication, collaboration, and service delivery.

IOT(Internet of things)

IoT stands for Internet of Things. It refers to the interconnectedness of everyday devices, such as smart phones, appliances, and vehicles that are equipped with sensors and internet connectivity, allowing them to collect and share data.

How IoT works?

IoT devices are equipped with sensors and internet connectivity, which allows them to collect data and send it to the cloud for storage and analysis. The data is then accessed and analyzed by various applications and services, which can be used to automate and control the device or provide insights and information to the user.

Once the data reaches the cloud, it can be stored in a database and analyzed using various tools such as big data and machine learning algorithms. The analyzed data can then be used to trigger actions, such as sending a notification to a user's smartphone or controlling a smart home device.

Overall, the IoT works by connecting devices, collecting data, sending it to the cloud for storage and analysis, and using the insights gained from that analysis to control and automate the devices.

Components of IoT

The main components of an IoT system include:

IoT Devices or Endpoints: These are the physical devices that are connected to the Internet and equipped with sensors and internet connectivity. Examples include smart thermostats, smart appliances, and fitness trackers.

Sensors and Actuators: These are the devices that collect data from the environment and perform actions based on the data. Sensors measure things like temperature, motion, and light, while actuators perform actions like turning on a light or opening a door.

Connectivity: This refers to the means by which the IoT devices connect to the internet and to each other. This can include wired or wireless technology such as Wi-Fi, Bluetooth, Zigbee, Z-Wave, and cellular networks.

Cloud or Edge Computing: This technology allows for the storage and analysis of the data collected by the IoT devices. Cloud computing involves sending the data to a remote server for storage and analysis, while edge computing involves processing the data locally, closer to the source of the data.

Platforms and Applications: These are the software tools and applications that allow for the management, control, and analysis of the data collected by the IoT devices. Examples include IoT platforms like AWS IoT, Azure IoT, and Google IoT, as well as various applications such as data visualization, analytics, and machine learning.

Security: As IoT device and data is connected to the internet, security is a critical component of IoT systems to prevent unauthorized access, misuse, and breaches of data. This includes encryption, authentication, and secure communications protocols to protect data and devices.

Q: What is AI?

A: AI stands for Artificial Intelligence. It refers to the simulation of human intelligence in machines that are programmed to perform tasks that typically require human intelligence, such as visual perception, speech recognition, decision-making, and language translation.

Q: How is AI used in everyday life?

A: AI is used in a variety of ways in everyday life, such as virtual assistants like Siri and Alexa, personalized recommendations on streaming platforms like Netflix and Spotify, fraud detection in banking and finance, and self-driving cars.

Q: What are the different types of AI?

A: There are mainly three types of AI:

(1) Narrow or Weak AI, which is designed to perform a specific task,

(2) General AI, which is designed to perform any intellectual task that a human can do, and

(3) Super AI, which surpasses human intelligence and can perform tasks that humans cannot.

Q: How does machine learning work?

A: Machine learning is a subset of AI that involves the use of algorithms and statistical models to enable machines to learn from data and improve their performance on a specific task over time. The machine is fed with data and algorithms that analyze and make predictions based on the data.

Q: What are some potential risks of AI?

A: Some potential risks of AI include job displacement, biased decision-making, loss of privacy, and the potential for AI to be used for malicious purposes, such as cyber-attacks or surveillance.

Q: Can AI replace humans?

A: AI can perform many tasks that humans do, but it is not capable of completely replacing humans. AI is designed to augment human capabilities and perform tasks that are difficult or impossible for humans to perform alone, but it cannot replicate human emotions, creativity, and problem-solving skills.

Q: How can we ensure ethical AI?

A: Ethical AI can be ensured by designing algorithms that are transparent and accountable, using unbiased data to train machines, involving diverse

perspectives in the development of AI, and ensuring that AI is used for the benefit of society as a whole.

Q: What is e-learning?

A: E-learning is the delivery of education and training courses using digital technologies, such as computers, the internet, and mobile devices.

Q: What are the benefits of e-learning?

A: Some benefits of e-learning include flexibility in scheduling, accessibility from anywhere with an internet connection, lower costs compared to traditional classroom learning, and the ability to customize learning experiences.

Q: What are some types of e-learning?

A: Some types of e-learning include online courses, virtual classrooms, self-paced learning modules, webinars, and Massive Open Online Courses (MOOCs).

Q: What are some tools used in e-learning?

A: Some tools used in e-learning include Learning Management Systems (LMS), video conferencing software, web-based training platforms, and interactive multimedia, and online collaboration tools.

Q: How does e-learning work?

A: E-learning works by providing learners with access to digital resources and materials that are designed to facilitate learning. Learners can access these resources through a variety of digital devices, including computers, smartphones, and tablets.

Q: What are some challenges of e-learning?

A: Some challenges of e-learning include lack of social interaction and collaboration, technological issues such as poor internet connectivity or hardware problems, difficulty in maintaining motivation and engagement, and the need for self-discipline and time-management skills.

Q: How can we overcome the challenges of e-learning?

A: We can overcome the challenges of e-learning by implementing strategies that encourage social interaction and collaboration, providing technical support to learners, designing engaging and interactive learning materials, and fostering self-discipline and time-management skills.

Q: Is e-learning as effective as traditional classroom learning?

A: Studies have shown that e-learning can be just as effective as traditional classroom learning, but its effectiveness depends on the quality of the content, the instructional design, and the level of learner engagement and motivation.