

EMERGING TRENDS – REVISION NOTES

1. List some of the cloud-based services.

- **Cloud Storage:** Google Drive, Sky Drive, Drop box etc.
- **Cloud software (SAAS):** Salesforce, Slack, Zoom etc.
- **Cloud Infrastructure (IAAS):** Digital Ocean, IBM, Datrium etc.
- **Cloud Platform (PAAS):** Acquia, AWS (Amazon Web Services), Heroku

2. What do you understand by the Internet of Things? List some of its potential applications.

IoT or Internet of Things refers to connecting many devices through hardware or software and communicate with each other as well as human beings through internet to work with collaboration and assist each other and form a networking of things.

Potential Applications of IoT:

- Smart Home
- Wearables
- Smart City
- Smart Grids
- Industrial Internet

3. Write a short note on the following:

a) Cloud computing

b) Big data and its characteristics

a) Cloud Computing:

In cloud computing refers to a virtual computer than can be access a software, services or storage on internet.

These software, services, and storage provided by cloud services providers based on payment or some of them are free also.

It allows to use large applications through the internet without any physical storage.

If you are using Facebook, google photos, google drive, sky drive, etc. these are examples of cloud computing.

Advantages:

1. Accessible anytime, anywhere on the internet
2. Cost-effective and reasonable cost
3. On-demand sources
4. Allows to use of resources as per the need

b) Big data and its characteristics

According to Gartner

“Big data” is high-volume, -velocity and -variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making. “

This definition clearly focuses on:

1. Large or Huge volume of data which is going to be processed
2. It can extract information which gives a huge benefit
3. It can help in decision making
4. It can provide insight information

Big data increases the volume day by day. It is in huge amount so cannot be processed or analysed using conventional methods. Some of the popular terms associated with big data for processing are data mining, data storage, data analysis, data sharing, and data visualization.

Characteristics of Big data

1. **Volume:** It refers to the number of big data in terms of size. It is in very big size or voluminous data.
2. **Velocity:** It refers to the rate of data transfer at very high speed.
3. **Variety:** Data is available in different forms like structured, unstructured, and semi structured. It can be different files like text, images, videos, web pages, etc.
4. **Veracity:** It refers to the intensity of the reliability of data. When a large volume of data is going to be processed, sometimes chances are there to produce incorrect data.
5. **Value:** It is the quantity of data including amount, reliability of data to be processed.

4. Explain the following

a) Artificial Intelligence and its applications

b) Machine Learning

a) Artificial Intelligence is made up of two words. Artificial refers to something which is made or produced by human beings rather than occurring naturally, especially as a copy of something natural.

Intelligence refers to the ability to acquire and apply knowledge and skills.

Now a days we have smartphones, smart televisions, smart calendars, smart cards etc. These appliances basically work on technology which is a part of Artificial Intelligence.

Terms like big data, machine learning, neural networks, etc are directly or indirectly connected to Artificial Intelligence.

Applications of AI in our daily life

AI has been dominant in various fields such as –

- Gaming
- Natural Language Processing
- Expert Systems
- Vision Systems
- Speech Recognition
- Handwriting Recognition
- Intelligent Robots

Artificial intelligence is a science and technology based on disciplines such as Computer Science, Biology, Psychology, Linguistics, Mathematics, and Engineering.

b) Machine learning refers to a branch or a division or a subset of Artificial Intelligence that requires data and a trained model algorithm. It learns by the data provided and improves the performance or processes. It applies to labelled or unlabelled data and makes a prediction.

Applications of Machine Learning

- Image Recognition
- Speech Recognition
- Traffic prediction
- Product recommendations
- Self-driving cars
- Email Spam and Malware Filtering

- Virtual Personal Assistant
- Online Fraud Detection
- Stock Market trading
- Medical Diagnosis
- Automatic Language Translation

5. Differentiate between cloud computing and grid computing.

Cloud Computing	Grid Computing
It works on the client-server architecture.	It works on distributed computing architecture.
Resources are stored on the server and provided to the user as and when required.	Resources are stored in a device and linked with the devices.
The server is the leader and controls the architecture.	All devices can be used in collaborative approach.
It is more flexible compared to Grid Computing.	It is less flexible compared to Cloud Computing.

6. Justify the following statement- 'Storage of data is cost-effective and time-saving in cloud computing.'

Cloud computing stores data into a server and it is available at almost free of cost or nominal cost.

When it comes to timesaving by saving data on the internet there is no need to wait to start up any computer or device. It is easily available with a browser program or app of that. So it can be accessed anytime from anywhere.

7. What is the on-demand service? How is it provided in the cloud computing?

On-demand service means that data is available as and when required. In cloud computing, users can access any file by using a login with a username or email account and password. This is called on-demand service.

8. Write examples of the following:

a) Government provided cloud computing platform

b) Large scale private cloud service providers and the services they provide

a) The government of India has provided a government cloud service named MeghRaj.

b) Google is large scale private cloud service providers which provides storage, web services and many more things.

9. If Government plans to make a smart school by applying IoT concepts, how can each of the following be implemented in order to transform a school into IoT enabled smart school?

a) e-textbooks

b) Smart boards

c) Online tests

d) Wi-Fi sensors on classrooms doors

e) Sensors in buses to monitor their location

f) Wearables (watches or smart belts) for attendance monitoring

- a) e-textbooks : e-textbooks can be made available e-library by using web services.
- b) Smart Boards: Smart boards can be operated by digital stylus or pen and should be connected with network.
- c) Online Tests: A web portal or online examination should be prepared to conduct exams smoothly.
- d) Wi-Fi sensors and classrooms doors: Wi-Fi sensors and classroom doors can be used to lock and unlock them. These sensors also provide security to students and other stakeholders.
- e) Sensors in buses to monitor their location: These sensors enable quick reporting and monitoring to the coordinates and parents to know the status of child and bus after leaving the school.
- f) Wearables (watches or smart belts) for attendance monitoring: These devices can be used or implemented for students in such a way that identifies a student and marks the attendance accordingly.

10. Five friends plan to try a start-up. However, they have a limited budget and limited computer infrastructure. How can they avail the benefits of cloud services to launch their start-up?

They can go for registration with any suitable service provider either government or private. They can register for Infrastructure as a service to avail the facility of cloud storage and deploy applications initially.

11. Governments provide various scholarships to students of different classes. Prepare a report on how blockchain technology can be used to promote accountability, transparency, and efficiency in the distribution of scholarships?

In blockchain technology, a separate ledger is created for individual and stored so the transparency and efficiency automatically improve. The students who can avail the scholarship in their ledger only. The transactions are also more authentic.

12. How IoT and WoT are related?

IoT and WoT both can be user on network to communicate with multiple devices. They can provide a communication medium between various devices, this medium can be an app, a web service or any network enabled device.
