INDIAN SCHOOL AL WADI AL KABIR

Class: XI Informatics Practices	Department: Computer Science	Date of submission: 16/02/2022
Worksheet No: 8	Topic: Emerging Trends	Note: Please answer these questions in your class note book

NCERT Solutions Emerging Trends

Q.I List some of the cloud-based services that you are using at present.

At present we are using many cloud-based services, some of them are as following:

1. **Cloud Storage**: Google Drive, Sky Drive, Drop box etc.
2. **Cloud software (SAAS):** SalesForce, Slack, Zoom etc.
3. **Cloud Infrastructure (IAAS)**: DigitalOcean, IBM, Datrium etc.
4. **Cloud Platform (PAAS):** Acquia, AWS (Amazon Web Services), Heroku

The next question for NCERT Solutions Emerging Trends is for potential applications.

Q.II 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 :

1. Smart Home
2. Wearables
3. Smart City
4. Smart Grids
5. Industrial Internet

Q.III 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

"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.

Q.IV Explain the following along with their applications.
a) Artificial Intelligence
b) Machine Learning

On a broad level, we can differentiate both AI and ML as:

AI is a bigger concept to create intelligent machines that can simulate human thinking capability and behaviour, whereas, machine learning is an application or subset of AI that allows machines to learn from data without being programmed explicitly.
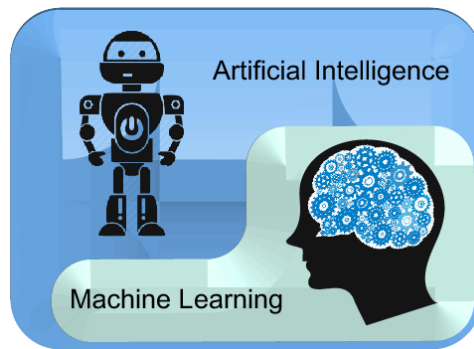
Below are some main differences between AI and machine learning along with the overview of Artificial intelligence and machine learning.

Artificial Intelligence

Artificial intelligence is a field of computer science which makes a computer system that can mimic human intelligence. It is comprised of two words "**Artificial**" and "**intelligence**", which means "a human-made thinking power." Hence we can define it as,

Artificial intelligence is a technology using which we can create intelligent systems that can simulate human intelligence.

The Artificial intelligence system does not require to be pre-programmed, instead of that, they use such algorithms which can work with their own intelligence. It involves machine learning algorithms such as Reinforcement learning algorithm and deep learning neural networks. AI is being used in multiple places such as Siri, Google's AlphaGo, AI in Chess playing, etc.

Machine learning

Machine learning is about extracting knowledge from the data. It can be defined as,

Machine learning is a subfield of artificial intelligence, which enables machines to learn from past data or experiences without being explicitly programmed.

Machine learning enables a computer system to make predictions or take some decisions using historical data without being explicitly programmed. Machine learning uses a massive amount of structured and semi-structured data so that a machine learning model can generate accurate result or give predictions based on that data.

Machine learning works on algorithm which learn by its own using historical data. It works only for specific domains such as if we are creating a machine learning model to detect pictures of dogs, it will only give result for dog images, but if we provide a new data like cat image then it will become unresponsive. Machine learning is being used in various places such as for online recommender system, for Google search algorithms, Email spam filter, Facebook Auto friend tagging suggestion, etc

Q.V Differentiate between cloud computing and grid computing with suitable examples.

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.

Q.VI 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 time-saving 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.

Q.VII What is the on-demand service? How it is 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.

Now the next question of NCERT Solutions Emerging Trends is based on examples.

Q.VIII 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) As we have discussed earlier google is large scale private cloud service providers which provides storage, web services and many more things.

The following are MCQ like questions for NCERT Solutions Emerging Trends.

Q.IX A company interested in cloud computing is looking for a provider who offers a set of basic services such as virtual server provisioning and on-demand storage that can be combined into a platform for deploying and running customized applications. What type of cloud computing model fit these requirements?
a) Platform as a Service

b) Software as a Service
c) Infrastructure as a Service

The correct answer is option c) Infrastructure as a Service

Q10 Which is not one of the features of IoT devices?
a) Remotely controllable
b) Programmable
c) Can turn themselves off if necessary
d) All of the above

The correct answer is option a) Remotely controllable

Look at the next question of NCERT Solutions Emerging Trends which is based on applications.

Q.XI 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) Wifi 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) Wifi sensors and classrooms doors: Wifi sensors and classroom doors can be used to lock and unlock them. These sensors also provides security to students and other stakeholders.

e) Sensors in buses to monitor their location: These sensors enables 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.

The next question of NCERT Solutions Emerging Trends is based on case study.

Q.XII Five friends plan to try a startup. However, they have a limited budget and limited computer infrastructure. How can they avail the benefits of cloud services to launch their startup?

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.

Q.XIII 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?

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

The next questions of NCERT Solutions Emerging Trends is based on relation.

Q.XIV 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.

The next part of NCERT Solutions Emerging Trends consists of the questions for match the following:

Q.XV Match the following:

S.No	Column A	Answer	Column B
1	You got a reminder to take medication	1 – 4	Smart Parking
2	You got a sms alert that you forgot to lock the door	2-3	Smart Wearable
3	You got the sms alert that parking space is available near your block	3-1	Home Automation
4	You turned off your LED TV from your wristwatch	4-2	Smart Health