IND ASSIGNMENT-01

Name: Yejji Akash

Roll No: 22052607

Sec:CSE-14

Chapter 1:

Short questions: -

Question 1:

Write a disadvantage of AI in the field of transportation?

Ans: A disadvantage of AI in transportation is the ethical and legal challenges it presents.

Autonomous vehicles, for example, raise questions about liability in the event of accidents. Determining who is responsible when an AI-controlled vehicle is involved in a collision can be complex.

Question 2:

Write a advantage of AI in the field of education?

Ans: AI-powered systems can analyze vast amounts of data on student performance, preferences,and learning styles to create tailored educational content and adaptive learning paths.

Question 3:

What is artificial intelligence(AI)?

Ans: It is the science and engineering of making intelligent machines, especially intelligent computer programs.

Question 4:

What is Machine Learning, and How Does It Relate to AI?

Ans: Machine learning is an application of AI. It's the process of using mathematical models of data to help a computer learn without direct instruction.

Long Questions:-

Question 1:

Write four advantage and disadvantages of AI?

Ans: Advantages are:

1. Reduction in Human Error - One of the biggest benefits of Artificial Intelligence is that it can significantly reduce errors and increase accuracy and precision. The decisions taken by AI in every step is decided by information previously gathered and a certain set of algorithms. When programmed properly, these errors can be reduced to null.
2. Another big benefit of AI is that humans can overcome many risks by letting AI robots do them for us. Whether it be defusing a bomb, going to space, exploring the deepest parts of oceans, machines with metal bodies are resistant in nature and can survive unfriendly atmospheres.
3. Faster decision-making is another benefit of AI. By automating certain tasks and providing real- time insights, AI can help organizations make faster and more informed decisions. This can be particularly valuable in high-stakes environments, where decisions must be made quickly and accurately to prevent costly errors or save lives.
4. AI-powered tools can help doctors and researchers analyze patient data, identify potential health risks, and develop personalized treatment plans. This can lead to better health outcomes for patients and help accelerate the development of new medical treatments and technologies.

Disadvanages are :

1. The ability to create a machine that can simulate human intelligence is no small feat. It requires plenty of time and resources and can cost a huge deal of money.
2. One application of artificial intelligence is a robot, which is displacing occupations and increasing unemployment (in a few cases). Therefore, some claim that there is always a chance of unemployment as a result of chatbots and robots replacing humans.
3. Ethics and morality are important human features that can be difficult to incorporate into an AI. The rapid progress of AI has raised a number of concerns that one day, AI will grow Ethics and morality are important human features that can be difficult to incorporate into an AI. The rapid progress of AI has raised a number of concerns that one day, AI will grow

1. A disadvantage of AI in transportation is the ethical and legal challenges it presents.

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Chapter 2:

Short questions: -

Question 1:

Write two characteristics of Industry revolutions?

Ans: Significant growth of transportation and communication and the use of energy sources.

Question 2:

Write Four Design principles of 4th industrial revolution?

Ans: Modularity ,service orientation,virtualization and decentralization.

Question 3:

What is cyber physical System(CPS)?

Ans: A cyber physical system (CPS) is a system of collaborating computational elements controlling physical entities. CPS are physical and engineered systems whose operations are monitored, coordinated, controlled and integrated by a computing and communication core. They allow us to add capabilities to physical systems by merging computing and communication with physical processes.

Question 4:

Give examples of Industry 4.0 produts?

Ans: Siemens,Trumpf,GE ec.

Long Questions:-

Question 1:

Explain basic concept of Industry 4.0?

Ans: Industry 4.0 (I4.0) is considered as a revolution for having significant impact in social, political, and economic shift from the digital age of the late 1990s and early 2000s to an era of embedded connectivity. It has blurred the demarcation between physical, digital and biological worlds. I4.0 represents advancements in computational technologies and their integration into industries. Focus involves the use of digital connectivity, and data-driven decision- making to transform manufacturing and service sectors.

Question 2:

Discuss about cyber physical system in detail?

Ans: A cyber-physical system (CPS) is a system of collaborating computational elements controlling physicalc entities. CPS are physical and engineered systems whose operations are monitored, coordinated,

controlled and integrated by a computing and communication core. They allow us to add capabilities to physical systems by merging computing and communication with physical processes.

The cyber-physical systems are the basis and enable new capabilities in areas such as product design,

prototyping and development, remote control, services and diagnosis, condition monitoring, proactive and predictive maintenance, track and trace, structural health and systems health monitoring, planning, innovation capability, agility, real-time applications and more.

Cyber-physical systems integrate computing, communication, and physical elements to create intelligent systems. CPS combines the physical world with digital technologies, enabling real-time monitoring, control, and coordination of physical processes. It involves the integration of sensors, actuators, and control systems with data networks.

Chapter 3:

Short questions: -

Question 1:

What is big data?

Ans: To get a handle on challenges of big data, you need to know what the word &quot;Big Data&quot; means. When we hear &quot;Big Data,&quot; we might wonder how it differs from the more common &quot;data.&quot; The term &quot;data&quot; refers to any unprocessed character or symbol that can be recorded on media or transmitted via electronic signals by a computer. Raw data, however, is useless until it is processed somehow.

Question 2:

What are five V’s of big data?

Ans: volume, velocity, variety, value, veracity.

Question 3:

What are the cahallenges of big data?

Ans: storage,processing,security.

Question 4:

What are the benefits of big data?

Ans: Gain more complete answers due to lots of information.

Complete different approach towards tackling problems due to increased information.

Long Questions:-

Question 1:

What are the different types of big data?

Ans: Structured Data

Structured data has certain predefined organizational properties and is present in structured or tabular schema, making it easier to analyze and sort. In addition, thanks to its predefined nature, each field is discrete and can be accessed separately or jointly along with data from other fields. This makes structured data extremely valuable, making it possible to collect data from various locations in the database quickly.

Unstructured data

Unstructured data entails information with no predefined conceptual definitions and is not easily interpreted or analyzed by standard databases or data models. Unstructured data accounts for the majority of big data and comprises information such as dates, numbers, and facts. Big data examples of this type include video and audio files, mobile activity, satellite imagery, and No-SQL databases, to name a few. Photos we upload on Facebook or Instagram and videos that we watch on YouTube or any other platform contribute to the growing pile of unstructured data.

### **Semi-structured data**

### Semi-structured data is a hybrid of structured and unstructured data. This means that it inherits a few characteristics of structured data but nonetheless contains information that fails to have a definite structure and does not conform with relational databases or formal structures of data models. For instance, JSON and XML are typical examples of semi-structured data.