COMPUTER

◆ Chapter 10 – Artificial Intelligence and Internet of Things (IoT)

◆ Short Questions, Answers, and Definitions

Section 10.1: Introduction to Artificial Intelligence

1. **What is Artificial Intelligence (AI)?**
   Answer:
   Artificial Intelligence is a technology that allows machines to think and learn like humans. It helps computers solve problems, understand language, and make decisions.
2. **How is AI changing our lives?**
   Answer:
   AI is being used in areas like healthcare, gaming, farming, and education. It improves our daily lives by making systems smarter and more efficient.
3. **Give one example of AI in agriculture.**
   Answer:
   AI is used to monitor crop health and predict harvest using data from sensors and drones.

10.1.1: Understanding AI

4. **Define Artificial Intelligence in simple words.**
   Answer:
   AI is when computers are made to think and learn like humans by copying human intelligence.
5. **Why is it important to understand the history of AI?**
   Answer:
   Understanding AI's history helps us know how the technology has improved and how it is used today.

10.1.2: Historical Context of AI

6. **Who introduced the term AI and when?**
   Answer:

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John McCarthy introduced the term Artificial Intelligence in 1956 at the Dartmouth Conference.

7. **Name two early developments in AI.**
   Answer:
   - 1950s-60s: Focused on solving problems with symbols.
   - 1970s-80s: Expert systems were created to mimic human decision-making.
8. **What is the Logic Theorist?**
   Answer:
   The Logic Theorist was the first AI program created in 1955 by Allen Newell and Herbert Simon to solve problems like a human.

10.1.3: Applications and Subfields of AI

9. **List three fields where AI is used.**
   Answer:
   AI is used in:
   - Healthcare
   - Education
   - Transportation
10. **How is AI used in education?**
    Answer:
    AI helps by giving students personalized learning, checking progress, and reducing teacher workload.
11. **What is the use of AI in self-driving cars?**
    Answer:
    AI controls vehicle movement, senses the road, and makes safe driving decisions.
12. **Define Machine Learning.**
    Answer:
    Machine Learning is a type of AI where computers learn from data and get better over time without being told what to do.
13. **What is Deep Learning?**
    Answer:
    Deep Learning is a part of Machine Learning that uses brain-like networks to learn from large amounts of data.
14. **What is Natural Language Processing (NLP)?**
    Answer:
    NLP helps computers understand and talk in human languages.
    Example: Siri or Alexa understanding voice commands.
15. **What is Computer Vision?**
    Answer:
    Computer Vision allows computers to see and understand pictures and videos.
16. **What is Robotics in AI?**
    Answer:
    Robotics is the science of designing robots that can do tasks like cleaning, surgery, or assembling cars.

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Section 10.2: AI Algorithms and Techniques

17. **What are AI algorithms?**
    Answer:
    AI algorithms are step-by-step methods that help computers solve problems or make decisions like humans.
18. **What is the difference between whitebox and blackbox AI?**
    Answer:

- **Whitebox AI:** Easy to understand how decisions are made.
- **Blackbox AI:** Hard to understand the decision-making process.

10.2.1.1: Explainable (Whitebox) Algorithms

19. **What are decision trees?**
    Answer:
    Decision trees help computers make decisions using a flow of yes/no questions.
20. **Explain Linear Regression.**
    Answer:
    Linear regression finds a link between two things, like study time and exam scores, to make predictions.
21. **What are rule-based systems?**
    Answer:
    Rule-based systems follow "if-then" rules written by people to decide what the computer should do.

10.2.1.2: Unexplainable (Blackbox) Algorithms

22. **What is a blackbox AI model?**
    Answer:
    It is an AI system where we can't see how it made its decision.
    Example: Deep Learning and neural networks.

Section 10.3: Introduction to IoT (Internet of Things)

23. **What is IoT?**
    Answer:
    IoT is a system where everyday devices are connected to the internet to share data and work smartly together.

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24. **Who coined the term IoT?**
    Answer:
    Kevin Ashton in 1999 while working at Procter & Gamble.

10.3.1.1: Components of IoT

25. **What is the role of sensors in IoT?**
    Answer:
    Sensors collect data like temperature, light, or motion from the environment.
26. **What are actuators?**
    Answer:
    Actuators turn data into actions, like turning on a fan when it gets hot.
27. **What is the role of networks in IoT?**
    Answer:
    Networks help devices communicate and share data through internet connections.
28. **What is data analysis in IoT?**
    Answer:
    It means studying the collected data to make smart decisions or improvements.

10.3.2: IoT Applications

29. **How is IoT used in healthcare?**
    Answer:
    IoT devices monitor patient health, remind them to take medicine, and alert doctors in emergencies.
30. **Give one example of IoT in transportation.**
    Answer:
    IoT is used in smart traffic lights and vehicle tracking systems to improve road safety.

10.3.3: IoT Security and Privacy

31. **Why is security important in IoT?**
    Answer:
    Because connected devices can be attacked by hackers, so strong security keeps our personal data safe.
32. **List two ways to keep IoT devices secure.**
    Answer:

- Use strong passwords
- Regularly update the software

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Section 10.4: Implications and Future of AI and IoT

33. **What are two risks of using AI and IoT?**
    Answer:

- **Data privacy:** Personal data can be misused.
- **Bias:** AI may make unfair decisions if trained with biased data.

34. **What are policy and regulatory frameworks in AI?**
    Answer:
    These are laws and rules to ensure AI and IoT are used safely, fairly, and ethically.
35. **How can AI and IoT improve daily life?**
    Answer:
    They make homes smarter, help in health monitoring, and improve transport and energy use.
36. **How are workplaces affected by AI and IoT?**
    Answer:
    AI automates repetitive tasks, and IoT helps manage machines and improve productivity.
37. **What is the societal impact of AI and IoT?**
    Answer:
    These technologies help in solving big problems like pollution, traffic, and healthcare access in smart cities.

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