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Class	10th	Chapter	07
Subject	Computer Science	Board	Punjab

CHAPTER 07: Applications of AI

EXERCISE SOLUTIONS

Multiple Choice Questions (MCQs)

1. What does AI stand for?

A) Automatic Intelligence B) Artificial Intelligence C) Active Interface D) Applied Information

Correct Answer: B) Artificial Intelligence

2. Which of the following is an example of Natural Language Processing (NLP)?

A) Online calculator B) Voice typing C) File copying D) Image editing

Correct Answer: B) Voice typing

3. What type of data helps AI make better decisions?

A) Short and weak data B) Only images C) Large and good quality data D) Data without labels

Correct Answer: C) Large and good quality data

4. Which tool uses AI to understand human voice?

A) Video player B) Translator C) Speech recognition D) Mouse

Correct Answer: C) Speech recognition

5. What is the role of robots in factories?

A) Watching videos B) Making websites C) Doing repeated or dangerous tasks D) Writing stories

Correct Answer: C) Doing repeated or dangerous tasks

6. What is a challenge of using AI?

A) It works slowly B) It cannot be turned off C) It may replace human jobs D) It cannot store data

Correct Answer: C) It may replace human jobs

7. What is bias in AI?

A) A computer error B) Equal results for everyone C) Unfair results due to bad data D) Fast performance

Correct Answer: C) Unfair results due to bad data

8. Why is fairness important in AI?

A) So the system looks good B) To avoid slow speed C) To give equal treatment to all users D) To use more memory

Correct Answer: C) To give equal treatment to all users

9. Which of these is NOT an AI tool?

A) Chatbot B) Face detection C) Spellchecker D) Paper notebook

Correct Answer: D) Paper notebook

Short Questions

1. What is Artificial Intelligence (AI)?

Answer:

Artificial Intelligence (AI) is a branch of computer science that focuses on developing smart machines and software capable of performing tasks that normally require human intelligence, such as reasoning, problem-solving, learning, understanding language, and making decisions.

2. How is AI used in daily life?

Answer:

AI is used in daily life through virtual assistants (like Siri and Google Assistant), navigation apps (such as Google Maps for live traffic updates), recommendation algorithms (on YouTube, Netflix, or Spotify), facial recognition to unlock smartphones, and automated spam filtering in email accounts.

3. Why does AI need large and good-quality data?

Answer:

AI algorithms learn patterns and rules directly from data. Large and high-quality data ensures that the AI model learns accurately, generalizes well to new situations, minimizes errors, and avoids bias, resulting in reliable predictions and smart decisions.

4. What is the role of Natural Language Processing (NLP)?

Answer:

Natural Language Processing (NLP) enables computers to understand, interpret, analyze, and generate human languages (both spoken and written). It powers technologies such as language translation apps, voice assistants, automated chatbots, and text auto-correct tools.

5. Give one example of robotics in everyday life.

Answer:

An example of robotics in everyday life is the **robotic vacuum cleaner** (such as Roomba), which automatically navigates home floors using sensors to clean dirt without direct human supervision.

6. What is the purpose of speech recognition technology?

Answer:

The purpose of speech recognition technology is to convert spoken human audio into readable digital text or actionable system commands. This enables hands-free device operation, voice typing, real-time audio transcription, and voice control.

7. How do recommendation systems work?

Answer:

Recommendation systems analyze a user's historical behavior, search queries, previous purchases, or content interactions alongside data from similar users using Machine Learning algorithms to predict and suggest content or products the user is most likely interested in.

8. What is meant by bias in AI systems?

Answer:

Bias in AI systems occurs when an AI model yields systematically skewed, unfair, or prejudiced decisions against specific groups of people. This typically happens because the training data used was incomplete, unrepresentative, or reflected existing human biases.

9. Why should AI systems be transparent and fair?

Answer:

AI systems must be transparent and fair to build human trust, prevent discrimination or injustice, ensure equal opportunities for all users regardless of background, and allow system developers to explain and audit how automated decisions are made.

Long Questions

1. What is the importance of data in AI? Explain why good and large data is needed.

Answer:

Importance of Data in AI: •

Data serves as the foundational fuel and foundation for any Artificial Intelligence system. Unlike traditional programs that follow explicitly coded rules, modern AI models (especially Machine Learning and Deep Learning models) derive their logic, rules, and decision-making capabilities entirely by analyzing training data.

Why Large and Good Data is Needed: •

1. **Higher Prediction Accuracy:** The more diverse examples an AI sees during training, the better it learns underlying patterns, leading to significantly higher decision accuracy.
2. **Reduction of Overfitting and Errors:** Small datasets often cause the model to memorize noise rather than learning general concepts, leading to errors on new data.
3. **Prevention of Bias:** A large, balanced dataset ensures representation across different demographics, preventing unfair or skewed results.
4. **Robustness:** High-quality, clean data ensures that missing values or corrupt data points do not distort the AI system's performance.

2. Write in detail about any three real-world applications of AI (such as NLP, robotics, or speech technology).

Answer:

1. Natural Language Processing (NLP):

NLP allows machines to read, process, and generate human language.

- *Real-World Applications:* Powered language translation tools (like Google Translate) allow real-time cross-language communication. Intelligent customer service chatbots (such as those used in banking apps like JazzCash or e-commerce stores) automatically process customer queries 24/7 without requiring human agents.

2. Robotics:

Robotics combines AI software with mechanical hardware to create autonomous or semi-autonomous physical machines.

- *Real-World Applications:* In manufacturing and automotive factories, industrial robots perform repetitive, heavy-lifting, or high-precision tasks such as welding and assembly safely. In healthcare, surgical robots assist doctors in performing delicate procedures with extreme precision.

3. Speech Recognition Technology:

Speech recognition converts spoken spoken audio signals into machine-understandable text commands.

- *Real-World Applications:* Smart voice assistants (like Google Assistant, Siri, and Alexa) allow users to set alarms, make phone calls, and control smart home appliances hands-free. Additionally, speech recognition enables automated live subtitling and dictation for accessibility.

3. Explain the ethical issues in AI. Why are fairness, privacy, and transparency important?

Answer:

As AI systems are integrated into critical domains like recruitment, law enforcement, banking, and healthcare, several ethical issues arise:

- **1. Importance of Fairness:**
  - **Issue:** If AI models are trained on biased historical data, they can perpetuate discrimination (e.g., automated hiring tools favoring certain demographics over others).
  - **Why Important:** Fairness ensures equal treatment, non-discrimination, and unbiased opportunities for all individuals, preventing AI from reinforcing societal harm.
- **2. Importance of Privacy:**
  - **Issue:** AI models require vast quantities of data to function, which often involves harvesting sensitive personal information, search histories, location logs, and biometric identifiers.
  - **Why Important:** Safeguarding privacy protects individuals from unauthorized surveillance, data misuse, identity theft, and breaches of personal confidentiality.
- **3. Importance of Transparency ("Explainable AI"):**
  - **Issue:** Many complex AI algorithms function as "black boxes," making it impossible to see how specific automated outputs or decisions were produced.

Why Important: Transparency allows developers and users to inspect, understand, audit, and hold AI systems accountable—especially when automated decisions affect human rights, loan approvals, or medical diagnoses.

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