ASSIGNMENT ANSWER KEY

CLASS 9

ARTIFICIAL INTELLIGENCE

Section A: Multiple Choice Questions (1 mark each)

1. **c)** Detecting faces to unlock a smartphone

(Computer Vision is used to analyze and recognize visual data such as images and faces.)

2. **b)** Problem Scoping → Data Acquisition → Data Exploration → Modeling → Evaluation → Deployment

(This is the correct and logical sequence of the AI Project Cycle.)

3. **b)** "Why" identifies the root cause of the problem

(In the 4Ws Canvas: *Who* – stakeholders, *What* – problem, *Where* – location, *Why* – reason or cause.)

4. **c)** X increases, Y also increases

(A "+" in a system map shows a **direct relationship** between variables.)

5. **c)** Drawing graphs to observe peak traffic hours

(This represents **Data Exploration**, where data patterns and trends are analyzed.)

Section B: Short Answer Questions (2 marks each)

1. Difference between AI and traditional IT solutions

- **AI systems** can **learn and improve automatically** from data, while **traditional IT systems** follow **fixed, rule-based programming**.
- **Example:**
  - *AI solution*: A chatbot that learns to respond better from user interactions.
  - *Traditional IT*: A chatbot that only replies with pre-programmed answers.

2. Importance of authentic data

- **Authentic data** ensures the AI model learns from accurate, unbiased, and reliable information.
- **Consequences of poor-quality data:**
    1. The model may produce **incorrect or misleading predictions**.
    2. It can lead to **bias and unfair decisions** during evaluation or deployment.

☑ **Total = 4 marks**

Section C: Short Answer Questions (3 marks each)

1. Detecting students wearing school ID cards

- **AI Domain:**
  → **Computer Vision** (image-based detection and recognition).
- **Data Features:**
    1. Student's image at entry gate
    2. Presence or absence of ID card (visual feature)
    3. Lighting conditions or camera angle
- **Data Collection Method:**
  → Use **CCTV cameras** or **mobile cameras** to capture entry gate footage, ensuring consent and privacy.

2. Analyzing student performance data

- **Visualization Techniques:**
  → Use **bar graphs**, **pie charts**, and **line graphs** to show marks distribution and trends.
- **Identifiable Patterns or Trends:**
    - Subjects where students perform well or poorly
    - Overall progress trends across terms
    - Comparison between average marks in different subjects or classes

Section D: Long Answer Question (5 marks)

1. AI Project: Monitoring Cleanliness in School Corridors

(a) Problem Statement using 4Ws Canvas

4Ws	Description
Who	School administration, cleaning staff, students

4Ws	Description
What	Monitoring and maintaining corridor cleanliness
Where	School corridors and common areas
Why	To ensure hygiene, health, and accountability in cleaning routines

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(b) Mapping the AI Project Cycle

1. **Problem Scoping:** Define the cleanliness problem and objectives.
2. **Data Acquisition:** Collect images or video data from corridor cameras showing clean and unclean areas.
3. **Data Exploration:** Label and analyze images (e.g., clean vs dirty).
4. **Modeling:** Train a **Computer Vision model** (e.g., image classification) to detect cleanliness levels.
5. **Evaluation:** Test model on unseen corridor images to check accuracy.
6. **Deployment:** Integrate model with real-time cameras to alert staff when cleaning is required.

(c) Role of Data Acquisition, System Mapping, and Visualization

- **Data Acquisition:** Gather authentic, high-quality visual data (camera feeds).
- **System Mapping:** Identify relationships (e.g., frequency of cleaning → cleanliness level).
- **Visualization:** Display cleanliness reports through dashboards or color-coded charts.

(d) Ethical Issues During Deployment

1. **Privacy Concerns:** Continuous camera monitoring may capture students and staff without consent.
2. **Bias or Misclassification:** Poor lighting or occlusions might falsely label clean areas as dirty, causing unfair feedback.