# INDIAN SCHOOL AL WADI AL KABIR

| Class: IX | Department: Computer Science |
|---|---|
| WORKSHEET | ARTIFICIAL INTELLIGENCE (417)<br>Part B Unit 2 Data Literacy |

**Read the questions carefully and circle the letter(s) (a), (b), (c) or (d) that best answer(s) the question.**

**(Note: There can be more than one correct choice)**

**1**. Cultivating Data Literacy means:

a) Utilize vocabulary and analytical skills
b) **Acquire, develop, and improve data literacy skills**
c) Develop skills in statistical methodologies
d) Develop skills in Math

**2**. Data Privacy and Data Security are often used interchangeably but they are different from each other

**a) True**
b) False

**3**. The_____ provides guidance on using data efficiently and with all levels of awareness.

a) data security framework
**b) data literacy framework**
c) data privacy framework
d) data acquisition framework

4. _____ allows us to understand why things are happening in a particular way

a) data
b) information
c) knowledge
**d) wisdom**

5. _____ is the practice of protecting digital information from unauthorized access, corruption, or theft throughout its entire lifecycle.

a**) data security**
b) data literacy
c) data privacy
d) data acquisition

6. What are the basic building blocks of qualitative data?

a) Individuals
b) Units
**c) Categories**
d) Measurements

7. Which among these is not a type of data interpretation?

a) Textual
b) Tabular
c) Graphical
**d) Raw data**

**8.** Quantitative data is numerical in nature.

**a) True**
b) False

9. A Bar Graph is an example of?

a) Textual
b) Tabular
**c) Graphical**
d) None of the above

10. _____ relates to the manipulation of data to produce meaningful insights.

**a) Data Processing**
b) Data Interpretation
c) Data Analysis
d) Data Presentation

## Subjective Type questions

**11. Define data literacy. Explain the importance of data literacy in modern world. 2Marls**

Data literacy is the ability to read, understand, create and communicate data as information. It is important in the modern world because:

(i) It helps us understand that different types of data may have good or poor quality,i.e., the data may be reliable or unreliable.
(ii) It helps us understand that different types of data carry different values or significance.
(iii) It makes it easier to understand how data is collected and presented.

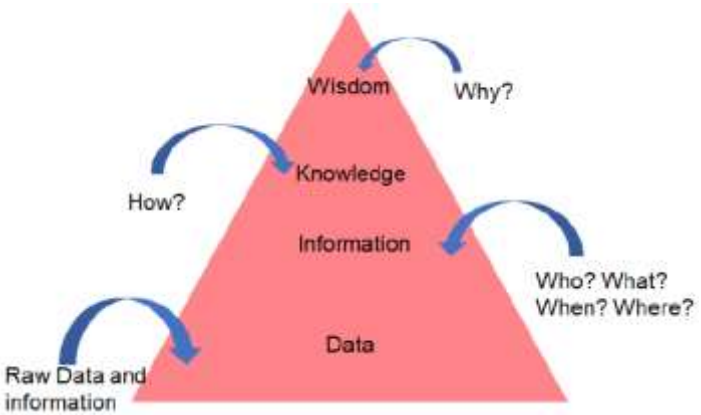
**12. What is the difference between data and information. 2 marks**

Data refers to raw facts and figures that are unprocessed and don't possess any meaning, e.g., a list of numbers (1, 2, 3, 4, 5…). On the other hand, information is processed data that has been organized, structured and presented in a meaningful context, e.g., if we add 'roll number' as context to the list of numbers, then the data becomes information.

**13. Explain the DIKW model with diagram 4 Marks**

The DIKW model is a pyramid-shaped model of knowledge management which represents the relationship between Data, Information, Knowledge and Wisdom.

(i) Data is the main component of the DIKW model and consists of raw facts, figures, etc. Data in this form is not very useful.
(ii) Information is processed data and is used to convey meaning within a specific context.
(iii) Knowledge provides a deeper understanding that is gained through interpreting the information. (Information about the world leads to knowledge of how things are happening.)
(iv) Wisdom is the highest level of the DIKW model and helps in decision-making. Wisdom allows us to understand why things are happening in a particular way.





**14. Differentiate Numeric and Textual data 2Marks**

| Textual Data (Qualitative Data) | Numeric Data (Quantitative Data) |
|---|---|
| • It is made up of words and phrases<br>• It is used for Natural Language Processing (NLP)<br>• Search queries on the internet are an example of textual data<br>• Example: "Which is a good park nearby?" | • It is made up of numbers<br>• It is used for Statistical Data<br>• Any measurements, readings, or values would count as numeric data<br>• Example: Cricket Score, Restaurant Bill |

**15. Differentiate data privacy and data security 2marks**

**Data privacy** referred to as information privacy is concerned with the proper handling of sensitive data including personal data and other confidential data, such as certain financial data and intellectual property data, to meet regulatory requirements as well as protecting the confidentiality and immutability of the data.

**Data security** is the practice of protecting digital information from unauthorized access, corruption, or theft throughout its entire lifecycle.

**16. Define data privacy. List down the best practices which can help you to ensure data privacy. 2marks**

(i) Understanding what data, you have collected, how it is handled, and where it is stored.

(ii) Necessary data required for a project should only be collected.

(iii) User consent while data collection must be of utmost importance.

**17. Explain why data security is it important? 2 marks**

(i) Due to the rising amount of data in the cloud there is an increased risk of cyber threats. The most appropriate step for such an amount of traffic being generated is how we control and protect the transfer of sensitive or personal information at every known place.

(ii) The most possible reasons why data security is more important now are:

Cyber-attacks affect all the people

The fast-technological changes will boom cyber attacks

**18. Define data acquisition. What are the steps for data acquisition1 4 marks**

Data Acquisition, also known as acquiring data, refers to the procedure of gathering data. This involves searching for datasets suitable for training AI models.

**1. Data Discovery -Searching for new datasets**

- Let's say we want to collect data for making a CV model for a self-driving car
- We will require pictures of roads and the objects on roads
- We can search and download this data from the internet
- This process is called **data discovery**

2. **Data Augmentation -adding more data to existing one**

- Data augmentation means increasing the amount of data by adding copies of existing data with small changes . New data is added by slightly changing the existing data
- Example: we get data on an image by changing different parameters like color and brightness .

3**. Data generation-generating data if data is not available**

- Data generation refers to generating or recording data using sensors
- Recording temperature readings of a building is an example of data generation
- Recorded data is stored in a computer in a suitable form

**19.What are primary and secondary data sources. Explain with example 2 MARKS**

- **Primary Data Sources** — Some of the sources for primary data include surveys, interviews, experiments, etc. The data generated from the experiment is an example of primary data.

- **Secondary Data Sources**—Secondary data collection obtains information from external sources, rather than generating it personally. Some sources for secondary data collection include Kaggle website, google data search and .gov data sets

**20.Explain any two ethical concerns in data acquisition 2 marks**

Write any two given below:


**21. Explain any two primary factors determining the usability of data: 2marks**

**1.Structure-** Defines how data is stored. We prefer structured data(spreadsheet) for AI projects

**2. Cleanliness-** Clean data is free from duplicates, missing values, outliers, and other anomalies that may affect its reliability and usefulness for analysis.

**3. Accuracy**- Accuracy indicates how well the data matches real-world values, ensuring reliability. Accurate data closely reflects actual values without errors, enhancing the quality and trustworthiness of the dataset.

(Write any two factors. 1 mark each)

**22. Differentiate Independent features and dependent features 2 Marks**

Independent features are the input to the model—they're the information we provide to make predictions.

Dependent features, on the other hand, are the outputs or results of the model—they're what we're trying to predict.


**23. Differentiate Data Processing and Data Interpretation 2 Marks**

**Data Processing :** Data processing helps computers understand raw data. Use of computers to perform different operations on data is included under data processing.

**Data Interpretation:** It is the process of making sense out of data that has been processed. The interpretation of data helps us answer critical questions using data.

**23. Differentiate Qualitative and Quantitative Data Interpretation 4 MARKS**

**Qualitative & Quantitative Data Interpretation**

| Qualitative Data Interpretation | Quantitative Data Interpretation |
|---|---|
| Categorical | Numerical |
| Provides insights into feelings and emotions | Provides insights into quantity |
| Answers how and why | Answers when, how many or how often |
| Methods – Interviews, Focus Groups | Methods – Assessment, Tests, Polls, Surveys |
| Example question – Why do students like attending online classes? | Example question – How many students like attending online classes? |

**24. Explain the type of data interpretation 4 Marks**

Ans: There are three ways in which data can be presented:

**Textual DI**

- The data is mentioned in the text form, usually in a paragraph.
- Used when the data is not large and can be easily comprehended by reading.
- Textual presentation is not suitable for large data

**Tabular DI**

- Data is represented systematically in the form of rows and columns.
- Title of the Table (Item of Expenditure) contains the description of the table content.
- Column Headings (Year; Salary; Fuel and Transport; Bonus; Interest on Loans; Taxes) contains the description of information contained in columns.

**Graphical DI**

In graphical interpretation different visualization tools can be used. Some example of such visualization tools are

1. **Bar Graphs**

In a Bar Graph, data is represented using vertical and horizontal bars

2. **Pie Charts**

Pie Charts have the shape of a pie and each slice of the pie represents the portion of the entire pie allocated to each category

3. **Line Graphs**

A line graph is created by connecting various data points.
It shows the change in quantity over time

**25. Explain different methods of data collection in qualitative and quantitative data interpretation 4 marks**

## 1.Qualitative Data Interpretation

Qualitative data tells us about the emotions and feelings of people
Qualitative data interpretation is focused on insights and motivations of people

**Data Collection Methods – Qualitative Data Interpretation**

- Record keeping: This method uses existing reliable documents and other similar sources of information as the data source. It is similar to going to a library.
- Observation: In this method, the participant – their behavior and emotions – are observed carefully
- Case Studies: In this method, data is collected from case studies.
- Focus groups: In this method, data is collected from a group discussion on relevant topic.
- Longitudinal Studies: This data collection method is performed on the same data source repeatedly over an extended period.
- One-to-One Interviews: In this method, data is collected using a one-to-one interview.

## 2. Quantitative Data Interpretation

Quantitative data interpretation is made on numerical data
It helps us answer questions like “when,” “how many,” and “how often”
For example – (how many) numbers of likes on the Instagram post

**Data Collection Methods -Quantitative Data Interpretation**

- **Interviews:** Quantitative interviews play a key role in collecting information.
- **Polls:** A poll is a type of survey that asks simple questions to respondents. Polls are usually limited to one question.
- **Observations:** Quantitative data can be collected through observations in a particular time period
- **Longitudinal Studies:** A type of study conducted over a long time
- **Survey:** Surveys can be conducted for a large number of people to collect quantitative data.