PM SHRI KENDRIYA VIDYALAYA NFC NAGAR GHATKESAR
SUMMER VACATIONS HOLIDAY HOMEWORK

Session: 2026-27
Class: XII

Artificial Intelligence

Part A: Quick Concept Check (Answer in 2–3 lines each)

1. Define NumPy. Explain any two features of NumPy with proper explanation.
2. What is a DataFrame in Pandas? Explain its structure with reference to rows and columns.
3. Differentiate between a NumPy array and a Pandas Series based on at least two points.
4. Explain the methods dropna() and fillna() in Pandas. Provide appropriate examples for
each method.
5. Define Linear Regression. Explain its purpose and give one real-life example.

Part B: AI Around Me (Observation Task)

1. Write a Python program to create a NumPy array and perform addition and multiplication operations on the array elements.
2. Write a Python program to create a Pandas DataFrame using a dictionary with columns 'Name' and 'Marks'.
3. Write a Python program to:
(a) Create a DataFrame containing missing values using appropriate representation such as np.nan.
(b) Apply dropna() to remove missing values.
(c) Apply fillna(0) to replace missing values.
4. Write the steps involved in Linear Regression in correct sequence. No code is required.

Part C: Case Study

A school wants to analyze student performance based on study hours and marks. Some data entries are missing in the dataset.
1. Which Python library will be used to handle and analyze this data?
2. Which methods can be used to handle missing values in the dataset?
3. Which algorithm can be used to predict marks based on study hours?
4. What type of data (categorical or continuous) is being predicted?