केन्द्रीय विद्यालय संगठन, क्षेत्रीय कार्यालय भोपाल
KENDRIYA VIDYALAYA SANGATHAN
REGIONAL OFFICE BHOPAL

तत् त्वं पूषन् अपावृणु
केन्द्रीय विद्यालय संगठन

QUESTION BANK
INFORMATICS PRACTICES (065)
CLASS - XII

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Unit-1 : Data Handling Using Pandas-I

DATA HANDLING USING PANDAS : INTRODUCTION

MCQs

1) The empty series object has which of the data type?
   a. int64 b. int32 c. float32 d.float64
2) You can create a Python pandas series using?
   a. Sequence b. ndarray c. tuple d.all of the above
3) While importing pandas and numpy, you must use identifier name as pd and np only. Choose the correct answer
   a. No, its not necessary
   b. Yes, Always otherwise it will produce error
   c. pd and np are keywords used for pandas and numpy
   d. pd and np are identifiers used in the respective module
4) Which of the following correct statement for creating empty series? (Assume that pandas library is already imported as pd)
   a. ser = pd.Series(NaN) b. ser = pd.Series(None) c. ser = pd.Series() d. ser = pd.Series
5) While createing a series in which of the following way you must need to specifies the index?
   a. Using a sequence b. Using dictionary c. Using tuple d. With a scalar value
6) In pandas, Index values must be?
   a. Unique b. hashable c. Both of the above d. None of the above
7) Which of the following is correct statement for creating a series to assign None to all series elements of 5 elements?
   a. s = pd.Series() b. s = pd.Series(None,index=[1,2,3,4,5])
   c. s = pd.Series(none,5) d. s = pd.Series(none*5)
8) In Pandas _____ is used to store data in multiple columns.
   a. Series b. DataFrame c. Both of the above d. None of the above
9) The following code create a dataframe named 'D1' with _____ columns.

```
import pandas as pd
D1 = pd.DataFrame([1,2,3] )
```

   a. 1 b. 2 c. 3 d. 4
10) A _____ is a two-dimensional labelled data structure .
   a. DataFrame b. Series c. List d. None of the above
11) Which of the following function is used to create DataFrame?
   a. DataFrame( ) b. NewFrame( ) c. CreateDataFrame( ) d. None of the Above
12) Which library is to be imported for creating DataFrame?
   a. Python b. DataFrame c. Pandas d. Random

13) _____ data Structure has both a row and column index.

a. List b. Series c. DataFrame d. None of the above

14) The following code create a dataframe named 'D1' with _____ columns.

```
import pandas as pd
dicts = [{'a':10, 'b':20}, {'a':5, 'b':10, 'c':20}]
D1 = pd.DataFrame(dicts)
```

a. 1 b. 2 c. 3 d. 4

15) DataFrame created from single Series has ____ column.

a. 1 b. 2 c. n (Where n is the number of elements in the Series) d. None of the above

16) Which of the following input can be accepted by DataFrame?

a. Structured ndarray b. Series c. DataFrame d. All of the mentioned

17) When we create DataFrame from List of Dictionaries, then number of rows in DataFrame is equal to the _____

a. maximum number of keys in first dictionary of the list
b. maximum number of keys in any dictionary of the list
c. number of dictionaries in the list
d. None of the above

18) To delete a row, the parameter axis of function drop( ) is assigned the value _____

a. 0 b. 1 c. 2 d. 3

19) NaN stands for:

a. Not a Number b. None and None c. Null and Null d. None a Number

20) Which of the following statements is false?

a. Dataframe is size mutable b. Dataframe is value mutable
c. Dataframe is immutable d. Dataframe is capable of holding multiple type of data

MLL Questions:

1) What is the significance of Pandas Library?
2) Explain different data structure of Python's Pandas Library, explain with example?
3) What is a Pandas series?
4) What is Dataframe?
5) Explain the different Features of Pandas?
6) Write and explain the different Attributes of Dataframe ?
7) Write a program to create the series with the help of Dictionary with index?

8) Write a program to create the given dataframe and sort the data in ascending order of age?
9) Write a program to create a series object using dictionary that stores the number of students in each house of class 12D of your school?
10) How to create a Series using Series method with list arguments?
11) How to create a Series using NumPy ndarray ?
12) How to create a Series from dictionary?
13) How to compare two series element by element?
14) How to create a Dataframe using Dictionary of lists?
15) How to set/ reset index of Dataframe?

ASSERTION AND REASONING Based Questions:

The following questions contains two statements : Assertion and Reasoning . Each question has four choice – (i), (ii), (iii), (iv) – only one of which is correct.

i) Both A and R are true and R is the correct explanation of A.
ii) Both A and R are true and R is not the correct explanation of A.
iii) A is true but R is false.
iv) A is false but R is true.

1) Assertion (A) : Elements of Series can be accessed using positional index.
Reason (R) : positional index values ranges from 1 to n if n is the size of the series.

2) Assertion (A) : Slicing can be also used to modify the series elements.
Reason (R): Series elements can be modified with list of values respectively.

3) Assertion (A): The mathematical operations can be performed in series and returns NaN if the index does not match.
Reason (R): The series required the same index for both series.

4) Assertion (A): The shape attribute of the series will return a tuple of the values from the series.
Reason (R): The series contains a tuple of a number of rows in one dimensional associated with a specified index.

5) Assertion (A) : In the pandas series, the index property is used to fetch the values using index labels.
Reason (R) : The series can have the only numeric index to working with series.

6) Assertion (A) : You can create pandas series from NDArray using NumPy library after import the NumPy module and creating Array using arrange() function.
Reason(R): NumPy is an open-source library that provides functions and properties for multidimensional array and matrix data structure.

7) Assertion (A) : We can perform mathematical operations on two series objects of different size but not on two 1 D arrays of different size.
Reason (R) : if two series are not aligned NaN are generated but in case of arrays no concept of NaN and hence operations fail to perform.

8) Assertion (A) : We can add two series objects using addition operator(+) or calling explicit function add() .
Reason (R) : While adding two series objects index matching is implemented and missing values are filled with NaN by default.

9) Assertion (A) : size attribute of Series objects returns length of series .
Reason (R) : count() will ignore the nan values in returning the output.

10) Assertion (A) : Dictionaries cannot be used to create a Series object.
Reason (R) : Dictionaries have key,value pairs and Series is a one dimensional data structure.

11) Assertion (A) : Elements of Series can be accessed using positional index.
Reason (R) : positional index values ranges from 1 to n if n is the size of the series.

12) Assertion (A) : import pandas as pd is used to import pandas library.
Reason (R) : It is a python library so it is to be imported for using its function.

13) Assertion (A) : Pandas.head() is used to display first/top 5 records of any series/dataframe.
Reason (R) : It displays the last 3 rows.

14) Assertion (A): Pandas is a library of Python.
Reason (R): Yes, we import pandas and can use functions of pandas like Series() and DataFrame() etc in python.

15) Assertion (A): A Series is a one-dimensional array containing a sequence of values of any data type (int, float, list, string, etc).
Reason (R): Pandas Series can be imagined as a column in a spreadsheet.

DATA HANDLING USING PANDAS- SERIES

MCQs

Topic: Creation of Series from ndarray, dictionary, scalar value

1. **Which of the following is a correct way to create a Series from a NumPy ndarray?**

   - (A) `pd.Series(ndarray)`
   - (B) `pd.Series(array)`
   - (C) `pd.Series(ndarray, index=ndarray)`
   - (D) `pd.Series(index=ndarray)`

   Answer: A

2. **What becomes the index when a Series is created from a dictionary?**

   - (A) The values of the dictionary
   - (B) The keys of the dictionary
   - (C) Sequential integers starting from 0
   - (D) The length of the dictionary

   Answer: B

3. **Creating a Series from a scalar value requires specifying which additional parameter?**

   - (A) `dtype`
   - (B) `index`
   - (C) `name`
   - (D) `columns`

   Answer: B

4. **What will be the output of `pd.Series(5, index=['a', 'b', 'c'])`?**

   - (A) A Series with values 5, 5, 5 and index 'a', 'b', 'c'

- (B) A Series with values 5, 5, 5 and default integer index
- (C) A Series with values 1, 2, 3 and index 'a', 'b', 'c'
- (D) An error

Answer: A

5. **If no index is provided, what index will a Series created from a list have?**
- (A) The values of the list
- (B) The length of the list
- (C) Sequential integers starting from 0
- (D) Sequential integers starting from 1

Answer: C

Topic: Mathematical Operations

1. **What is the result of adding a scalar to a Pandas Series?**
- (A) Adds the scalar to each element of the Series
- (B) Multiplies each element of the Series by the scalar
- (C) Raises each element of the Series to the power of the scalar
- (D) Divides each element of the Series by the scalar

Answer: A

2. **What happens when you add two Series of different lengths?**
- (A) The operation fails
- (B) The shorter Series is extended with NaN values
- (C) The operation aligns by index and fills missing values with NaN
- (D) Only elements up to the length of the shorter Series are added

Answer: C

3. **Which of the following operations is performed element-wise on a Series?**
   - (A) Addition with another Series
   - (B) Scalar multiplication
   - (C) Boolean comparison
   - (D) All of the above

   Answer: D

4. **What will be the result of `series1 * series2` if `series1` and `series2` have the same indices?**
   - (A) Element-wise multiplication of the Series
   - (B) Series1 values replaced by Series2 values
   - (C) Series with the sum of corresponding values
   - (D) Series with the product of the indices

   Answer: A

5. **If you have `series = pd.Series([1, 2, 3, 4])`, what will `series + 5` return?**
   - (A) `0 6 1 7 2 8 3 9 dtype: int64`
   - (B) `0 1 1 2 2 3 3 4 dtype: int64`
   - (C) `0 6 1 7 2 8 3 9 dtype: object`
   - (D) An error

   Answer: A

Topic: Head and Tail Functions

1. **What does the `head()` function do by default in Pandas?**
   - (A) Returns the first 3 rows

- (B) Returns the last 5 rows
- (C) Returns the first 5 rows
- (D) Returns all rows

Answer: C

2. **How can you get the last 7 rows of a Series?**
   - (A) `series.head(7)`
   - (B) `series.tail(7)`
   - (C) `series.iloc[-7:]`
   - (D) `series[-7:]`

   Answer: B

3. **What does `series.head(3)` return if `series` has 10 elements?**
   - (A) The first 3 elements
   - (B) The last 3 elements
   - (C) All elements
   - (D) An error

   Answer: A

4. **If `series = pd.Series([10, 20, 30, 40, 50])`, what does `series.tail(2)` return?**
   - (A) `3 40 4 50 dtype: int64`
   - (B) `0 10 1 20 dtype: int64`
   - (C) `4 50 dtype: int64`
   - (D) `1 20 2 30 dtype: int64`

   Answer: A

5. **What does `series.head(0)` return?**

   - (A) The first element
   - (B) An empty Series
   - (C) The entire Series
   - (D) An error

   Answer: B

Topic: Selection, Indexing, and Slicing

1. **How can you access the element at index `2` in a Series `series`?**

   - (A) `series[2]`
   - (B) `series.loc[2]`
   - (C) `series.iloc[2]`
   - (D) All of the above

   Answer: D

2. **What does `series['a':'c']` return if `series` has string indices?**

   - (A) Elements between 'a' and 'c' inclusive
   - (B) Elements between 'a' and 'c' exclusive
   - (C) Only the element at 'c'
   - (D) An error

   Answer: A

3. **Which method would you use for integer-location based indexing?**

   - (A) `loc`
   - (B) `iloc`
   - (C) `index`

- (D) `position`

Answer: B

4. **How can you select multiple non-contiguous elements in a Series?**

- (A) Using a list of indices
- (B) Using a slice
- (C) Using a boolean array
- (D) Both A and C

Answer: D

5. **What will `series.iloc[-3:]` return?**

- (A) The last 3 elements of the Series
- (B) The first 3 elements of the Series
- (C) An error
- (D) The elements excluding the last 3

Answer: A

MLL Questions:

1. **What is a Series in Python's pandas library?**

- Answer: A Series is a one-dimensional array-like object in pandas that can hold any data type (integers, strings, floating-point numbers, etc.). It is similar to a column in an Excel sheet.

2. **How do you import the pandas library in Python?**

- Answer: `import pandas as pd`

3. **Write a code snippet to create a Series from a list [10, 20, 30, 40, 50].**

- Answer: `import pandas as pd; s = pd.Series([10, 20, 30, 40, 50])`

4. **How can you create a Series with custom indices ['a', 'b', 'c', 'd', 'e'] from the list [10, 20, 30, 40, 50]?**
   - Answer: `s = pd.Series([10, 20, 30, 40, 50], index=['a', 'b', 'c', 'd', 'e'])`

5. **What function is used to create a Series from a dictionary {'a': 1, 'b': 2, 'c': 3}?**
   - Answer: `pd.Series({'a': 1, 'b': 2, 'c': 3})`

6. **How can you access the value at index 'b' in the Series created from the dictionary {'a': 1, 'b': 2, 'c': 3}?**
   - Answer: `s = pd.Series({'a': 1, 'b': 2, 'c': 3}); value = s['b']`

7. **Write a code to create a Series from a NumPy array `np.array([1, 2, 3, 4, 5])`.**
   - Answer: `import numpy as np; import pandas as pd; arr = np.array([1, 2, 3, 4, 5]); s = pd.Series(arr)`

8. **What attribute of a Series object can be used to view the index labels of the Series?**
   - Answer: `s.index`

9. **How do you change the index of a Series to ['w', 'x', 'y', 'z'] for a Series with 4 elements?**
   - Answer: `s.index = ['w', 'x', 'y', 'z']`

10. **What is the output of `s[1]` if `s = pd.Series([5, 10, 15, 20, 25])`?**
    - Answer: `10`

11. **How can you check if the index 'a' exists in the Series `s`?**
    - Answer: `'a' in s`

12. **Write a code to create a Series with default indices from a tuple (10, 20, 30, 40).**
    - Answer: `s = pd.Series((10, 20, 30, 40))`

13. **What is the method to retrieve the first 3 elements of a Series `s`?**
    - Answer: `s.head(3)`

14. **Write a code to create an empty Series and assign it to the variable `s`.**

- Answer: `s = pd.Series()`

15. **Explain how to convert a Series to a list.**

- Answer: Use the `tolist()` method. Example: `s.tolist()`

These questions should help Class 12th CBSE students get a good grasp of the basics of creating and manipulating Series in Python using the pandas library.

ASSERTION AND REASONING Based Questions:

Topic: Creation of Series from ndarray, dictionary, scalar value

1. **Assertion:** A Pandas Series can be created from a NumPy ndarray.

Reasoning: Because a Series is essentially a one-dimensional labeled array capable of holding any data type.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: A

2. **Assertion:** When creating a Series from a dictionary, the keys become the index.

Reasoning: This is because a Series can automatically use the keys of a dictionary as index labels for the corresponding values.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: A

3. **Assertion:** A Series created from a scalar value will have the same value for all elements.

Reasoning: Because when a scalar value is used, Pandas creates a Series of the specified length where each element is the scalar value.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: A

4. **Assertion:** If no index is provided, Pandas will generate a default integer index starting from 1.

Reasoning: Because Pandas uses integers as default index values.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: C

5. **Assertion:** You cannot create a Pandas Series from a dictionary with mixed data types.

Reasoning: Because a Series can only hold data of a single type.

- (A) Both assertion and reasoning are true, and the reasoning is the correct

explanation for the assertion.

- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: D

Topic: Mathematical Operations

1. **Assertion:** Mathematical operations on a Pandas Series are element-wise.

Reasoning: Because Pandas is designed to perform vectorized operations to enhance performance and efficiency.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: A

2. **Assertion:** Adding a scalar to a Pandas Series adds the scalar value to each element in the Series.

Reasoning: This operation is called broadcasting, where the scalar is broadcasted to all elements in the Series.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: A

3. **Assertion:** When performing element-wise operations between two Series, their indices must match.

Reasoning: Because Pandas aligns Series based on their indices before performing element-wise operations.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: A

4. **Assertion:** Multiplying a Series by another Series with different indices results in NaN values.

Reasoning: Pandas aligns the indices of the two Series, and any index without a match results in NaN.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: A

5. **Assertion:** The operation `Series1 + Series2` will result in a Series of the same length as `Series1`.

Reasoning: Because the length of the resulting Series is determined by the length of the longer Series.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: D

Topic: Head and Tail Functions

1. **Assertion:** The `head()` function in Pandas returns the first n rows of a Series.

Reasoning: This is useful for quickly inspecting the beginning of a Series.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: A

2. **Assertion:** By default, the `tail()` function returns the last 10 rows of a Series.

Reasoning: This helps in quickly inspecting the end of a Series.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: D

3. **Assertion:** `head()` and `tail()` functions can only be used with Series and not with DataFrames.

Reasoning: Because these functions are designed to work with one-dimensional data structures.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: D

4. **Assertion:** The `head(n=3)` function call returns the first three elements of a Series.

Reasoning: Because the `n` parameter specifies the number of rows to return from the start.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: A

5. **Assertion:** The `tail(n=5)` function call returns the last five elements of a Series.

Reasoning: This function call is useful for inspecting the last few elements of a Series.

- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.

- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: A

Topic: Selection, Indexing, and Slicing

1. **Assertion:** You can select a single element from a Series using its index label.
   Reasoning: Because a Series is indexed and elements can be accessed using these labels.
   - (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
   - (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
   - (C) The assertion is true, but the reasoning is false.
   - (D) Both assertion and reasoning are false.

   Answer: A

2. **Assertion:** Slicing a Series using `Series[start:stop]` includes the element at the `stop` position.
   Reasoning: This follows the standard Python slicing convention where the stop index is inclusive.
   - (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
   - (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
   - (C) The assertion is true, but the reasoning is false.
   - (D) Both assertion and reasoning are false.

   Answer: C

3. **Assertion:** Indexing a Series with a list of indices returns a Series containing only the specified indices.
   Reasoning: This allows for selecting multiple elements at once.
   - (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
   - (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.

- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: A

4. **Assertion:** A Series cannot be indexed by boolean arrays.
Reasoning: Boolean indexing is not supported in Pandas Series.
- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: D

5. **Assertion:** The method `iloc` is used for integer-location based indexing in a Series.
Reasoning: `iloc` allows selecting elements based on their integer index positions, not the index labels.
- (A) Both assertion and reasoning are true, and the reasoning is the correct explanation for the assertion.
- (B) Both assertion and reasoning are true, but the reasoning is not the correct explanation for the assertion.
- (C) The assertion is true, but the reasoning is false.
- (D) Both assertion and reasoning are false.

Answer: A

These questions should help in understanding various aspects of creating and manipulating Pandas Series.

CBT Questions:

Topic: Creation of Series from ndarray, dictionary, scalar value

1. **Task:** Create a Pandas Series from the NumPy ndarray `array = np.array([1, 2, 3, 4, 5])`.

Question: Write the code to create the Series and print it.

```python
import numpy as np
import pandas as pd
array = np.array([1, 2, 3, 4, 5])
series = pd.Series(array)
print(series)
```

2. **Task:** Create a Pandas Series from the dictionary `data = {'a': 10, 'b': 20, 'c': 30}`.

Question: Write the code to create the Series and print it.

```python
data = {'a': 10, 'b': 20, 'c': 30}
series = pd.Series(data)
print(series)
```

3. **Task:** Create a Pandas Series from the scalar value `5` with the index `['x', 'y', 'z']`.

Question: Write the code to create the Series and print it.

```python
series = pd.Series(5, index=['x', 'y', 'z'])
print(series)
```

4. **Task:** Create a Series from the list `[1, 2, 3, 4, 5]` without specifying an index.

Question: Write the code to create the Series and print it. What will be the default index?

```python
series = pd.Series([1, 2, 3, 4, 5])
print(series)
```

Default index: The default index will be integers starting from 0.

5. **Task:** Create a Series from the dictionary `data = {'a': 1, 'b': 2}` and assign it to a variable `series`. Then, print the data type of the values in the Series.

Question: Write the code to create the Series and print the data type.

```python
data = {'a': 1, 'b': 2}
series = pd.Series(data)
print(series.dtype)
```

Topic: Mathematical Operations

1. **Task:** Given `series1 = pd.Series([1, 2, 3])` and `series2 = pd.Series([4, 5, 6])`, perform element-wise addition.

   Question: Write the code to add `series1` and `series2` and print the result.

   ```python
   series1 = pd.Series([1, 2, 3])
   series2 = pd.Series([4, 5, 6])
   result = series1 + series2
   print(result)
   ```

2. **Task:** Multiply the Series `series = pd.Series([10, 20, 30])` by 2.

   Question: Write the code to multiply the Series by 2 and print the result.

   ```python
   series = pd.Series([10, 20, 30])
   result = series * 2
   print(result)
   ```

3. **Task:** Given `series1 = pd.Series([1, 2, 3])` and `series2 = pd.Series([1, 2])`, perform element-wise subtraction.

   Question: Write the code to subtract `series2` from `series1` and print the result.

   ```python
   series1 = pd.Series([1, 2, 3])
   series2 = pd.Series([1, 2])
   result = series1 - series2
   print(result)
   ```

4. **Task:** Create a Series `series = pd.Series([1, 2, 3, 4])`. Calculate the square of each element.

   Question: Write the code to square each element and print the result.

   ```python
   series = pd.Series([1, 2, 3, 4])
   result = series ** 2
   print(result)
   ```

5. **Task:** Given `series1 = pd.Series([10, 20, 30])` and `series2 = pd.Series([1, 2, 3])`, perform element-wise division.

   Question: Write the code to divide `series1` by `series2` and print the result.

   ```python
   series1 = pd.Series([10, 20, 30])
   series2 = pd.Series([1, 2, 3])
   result = series1 / series2
   print(result)
   ```

Topic: Head and Tail Functions

1. **Task:** Create a Series `series = pd.Series(range(10))`. Use the `head` function to get the first 3 elements.

   Question: Write the code to get and print the first 3 elements.

   ```python
   series = pd.Series(range(10))
   result = series.head(3)
   print(result)
   ```

2. **Task:** Create a Series `series = pd.Series(range(20))`. Use the `tail` function to get the last 5 elements.

   Question: Write the code to get and print the last 5 elements.

   ```python
   series = pd.Series(range(20))
   result = series.tail(5)
   print(result)
   ```

```

3. **Task:** Create a Series `series = pd.Series([100, 200, 300, 400, 500])`. Use the `head` function without any parameters.

   **Question:** Write the code and print the result. How many elements are returned?

   ```python
   series = pd.Series([100, 200, 300, 400, 500])
   result = series.head()
   print(result)
   ```

   Number of elements returned: 5 (default value).

4. **Task:** Create a Series `series = pd.Series(range(1, 11))`. Use the `tail` function with parameter 0.

   Question: Write the code and print the result. What is returned?

   ```python
   series = pd.Series(range(1, 11))
   result = series.tail(0)
   print(result)
   ```

   Returned: An empty Series.

5. **Task:** Create a Series `series = pd.Series(range(5, 15))`. Use both `head` and `tail` functions to get the first 2 and last 2 elements.

   Question: Write the code to get and print both results.

   ```python
   series = pd.Series(range(5, 15))
   head_result = series.head(2)
   tail_result = series.tail(2)
   print("Head:", head_result)
   print("Tail:", tail_result)
   ```

Topic: Selection, Indexing, and Slicing
   ```

1. **Task:** Create a Series `series = pd.Series([10, 20, 30, 40, 50], index=['a', 'b', 'c', 'd', 'e'])`. Select the element at index 'c'.

Question: Write the code to select and print the element.

```python
series = pd.Series([10, 20, 30, 40, 50], index=['a', 'b', 'c', 'd', 'e'])
result = series['c']
print(result)
```

2. **Task:** Create a Series `series = pd.Series(range(10))`. Use slicing to get the elements from index 2 to 5.

Question: Write the code to slice and print the result.

```python
series = pd.Series(range(10))
result = series[2:6]
print(result)
```

3. **Task:** Create a Series `series = pd.Series([1, 2, 3, 4, 5, 6, 7, 8, 9, 10])`. Select the elements at positions 1, 3, and 5 using integer indexing.

Question: Write the code to select and print the elements.

```python
series = pd.Series([1, 2, 3, 4, 5, 6, 7, 8, 9, 10])
result = series.iloc[[1, 3, 5]]
print(result)
```

4. **Task:** Create a Series `series = pd.Series([100, 200, 300, 400, 500], index=['a', 'b', 'c', 'd', 'e'])`. Use boolean indexing to select elements greater than 300.

Question: Write the code to select and print the elements.

```python
series = pd.Series([100, 200, 300, 400, 500], index=['a', 'b', 'c', 'd', 'e'])
result = series[series > 300]
print(result)
```

```

5. **Task:** Create a Series `series = pd.Series(range(1, 6), index=['a', 'b', 'c', 'd', 'e'])`. Select elements at indices 'b' and 'd' using label-based indexing.

**Question:** Write the code to select and print the elements.

```python
series = pd.Series(range(1, 6), index=['a', 'b', 'c', 'd', 'e'])
result = series.loc[['b', 'd']]
print(result)
```

CASE STUDY BASED Questions:

Topic: Creation of Series from ndarray, dictionary, scalar value

1. **Case Study:** A data scientist is working on a machine learning project and has a NumPy array of feature values for a dataset.

Question: How can the data scientist convert the following NumPy array `features = np.array([0.1, 0.2, 0.3, 0.4, 0.5])` into a Pandas Series? Write the code and explain why this step is useful.

```python
import numpy as np
import pandas as pd
features = np.array([0.1, 0.2, 0.3, 0.4, 0.5])
series = pd.Series(features)
print(series)
```

Explanation: Converting to a Pandas Series allows for easier manipulation and integration with other data processing tasks in Pandas.

2. **Case Study:** A financial analyst has data about stock prices stored in a dictionary with dates as keys and prices as values.

Question: How can the analyst create a Series from the following dictionary `stock_prices = {'2024-01-01': 150, '2024-01-02': 152, '2024-01-03': 148}`? Write the code and explain how the resulting Series can be used.

```python

```
stock_prices = {'2024-01-01': 150, '2024-01-02': 152, '2024-01-03': 148}

series = pd.Series(stock_prices)

print(series)
```

Explanation: The resulting Series can be used for time series analysis, plotting, and further statistical computations.

3. **Case Study:** An engineer needs to initialize a Series with a constant value to represent a baseline measurement for multiple sensors.

Question: How can the engineer create a Series with a scalar value `baseline = 10` for sensors indexed as `['sensor1', 'sensor2', 'sensor3']`? Write the code and discuss the significance of initializing with a scalar value.

```python
baseline = 10

series = pd.Series(baseline, index=['sensor1', 'sensor2', 'sensor3'])

print(series)
```

Explanation: Initializing with a scalar value is useful for setting default or baseline values for comparison or further calculations.

4. **Case Study:** A researcher collects daily temperature readings and stores them in a list. They need to convert this list into a Series for further analysis.

Question: How can the researcher create a Series from the list `temperatures = [22, 21, 23, 22, 20]`? Write the code and explain how the index will be assigned.

```python
temperatures = [22, 21, 23, 22, 20]

series = pd.Series(temperatures)

print(series)
```

Explanation: The index will be automatically assigned as sequential integers starting from 0.

5. **Case Study:** A teacher records scores for a test in a dictionary with student names as keys and scores as values. They need to analyze these scores using Pandas.

Question: How can the teacher create a Series from the dictionary `scores = {'Alice': 85, 'Bob': 90, 'Charlie': 78}`? Write the code and explain how this Series can be utilized.

```python
scores = {'Alice': 85, 'Bob': 90, 'Charlie': 78}
series = pd.Series(scores)
print(series)
```

Explanation: This Series can be used to calculate statistics like mean, median, and standard deviation of the scores.

Topic: Mathematical Operations

1. **Case Study:** A data analyst has two Series representing sales data for two quarters. They need to calculate the total sales.

Question: How can the analyst add the Series `sales_q1 = pd.Series([200, 250, 300])` and `sales_q2 = pd.Series([220, 270, 320])`? Write the code and explain the result.

```python
sales_q1 = pd.Series([200, 250, 300])
sales_q2 = pd.Series([220, 270, 320])
total_sales = sales_q1 + sales_q2
print(total_sales)
```

Explanation: The result is the element-wise addition of the two Series, giving total sales for each corresponding period.

2. **Case Study:** A scientist has a Series representing experimental data. They need to normalize this data by subtracting the mean.

Question: How can the scientist normalize the Series `data = pd.Series([10, 20, 30, 40, 50])`? Write the code and explain the steps.

```python
data = pd.Series([10, 20, 30, 40, 50])
normalized_data = data - data.mean()
print(normalized_data)
```

```

**Explanation:** Subtracting the mean centers the data around 0, which is useful for further statistical analysis.

3. **Case Study:** A mathematician needs to calculate the square of each element in a Series for a certain calculation.

**Question:** How can the mathematician calculate the square of the Series `numbers = pd.Series([1, 2, 3, 4])`? Write the code and explain the significance of element-wise operations.

```python
numbers = pd.Series([1, 2, 3, 4])
squared_numbers = numbers ** 2
print(squared_numbers)
```

Explanation: Element-wise operations allow for efficient and concise calculations across all elements in the Series.

4. **Case Study:** An economist needs to adjust prices in a Series by multiplying them with a factor of 1.05 to account for inflation.

Question: How can the economist adjust the Series `prices = pd.Series([100, 200, 300])`? Write the code and explain the importance of such adjustments.

```python
prices = pd.Series([100, 200, 300])
adjusted_prices = prices * 1.05
print(adjusted_prices)
```

Explanation: Adjusting for inflation helps in understanding the real value changes over time.

5. **Case Study:** A teacher wants to apply a curve to test scores by adding 5 points to each score.

Question: How can the teacher curve the Series `scores = pd.Series([70, 80, 90])`? Write the code and discuss the potential impacts of curving scores.
```

```python
scores = pd.Series([70, 80, 90])
curved_scores = scores + 5
print(curved_scores)
```

Explanation: Curving scores can improve overall grades and may be used to adjust for test difficulty.

Topic: Head and Tail Functions

1. **Case Study:** A researcher has a large Series of experimental data and wants to quickly inspect the first few entries.

Question: How can the researcher use the `head` function on the Series `data = pd.Series(range(100))` to get the first 5 elements? Write the code and explain why this is useful.

```python
data = pd.Series(range(100))
first_five = data.head()
print(first_five)
```

Explanation: The `head` function is useful for quickly inspecting the beginning of a Series to understand its structure and content.

2. **Case Study:** An analyst is working with a time series dataset and wants to see the most recent entries.

Question: How can the analyst use the `tail` function on the Series `time_series = pd.Series(range(50))` to get the last 3 elements? Write the code and explain its significance.

```python
time_series = pd.Series(range(50))
last_three = time_series.tail(3)
print(last_three)
```

Explanation: The `tail` function allows for quick inspection of the most recent data, which is often critical in time series analysis.

3. **Case Study:** A data scientist needs to verify the initial values in a Series to ensure data integrity before further processing.

Question: How can the data scientist use the `head` function on `data = pd.Series([5, 10, 15, 20, 25, 30])` to check the first 2 elements? Write the code and explain the benefits.

```python
data = pd.Series([5, 10, 15, 20, 25, 30])
first_two = data.head(2)
print(first_two)
```

Explanation: Checking initial values helps in validating data before applying any transformations or analysis.

4. **Case Study:** A teacher has a Series of student scores and wants to see how the last few students performed.

Question: How can the teacher use the `tail` function on `scores = pd.Series([80, 85, 90, 75, 95, 88])` to get the last 4 scores? Write the code and discuss the importance.

```python
scores = pd.Series([80, 85, 90, 75, 95, 88])
last_four = scores.tail(4)
print(last_four)
```

Explanation: This allows the teacher to focus on the recent performance of students, which can be helpful for identifying trends or issues.

5. **Case Study:** An inventory manager needs to check the most recent additions to the stock.

Question: How can the manager use the `tail` function on `inventory = pd.Series(range(100, 110))` to get the last element? Write the code and explain its usefulness.

```python
```

```
inventory = pd.Series(range(100, 110))

last_item = inventory.tail(1)

print(last_item)
```

Explanation: Checking the most recent addition helps in verifying the latest stock updates and ensuring accurate inventory management.

Topic: Selection, Indexing, and Slicing

1. **Case Study:** A data analyst has a Series with sales data indexed by months and wants to access the sales data for March.

Question: How can the analyst select the element at index 'March' in the Series `sales = pd.Series([200, 250, 300, 400], index=['January', 'February', 'March', 'April'])`? Write the code and explain the importance.

```python
sales = pd.Series([200, 250, 300, 400], index=['January', 'February', 'March', 'April'])

march_sales = sales['March']

print(march_sales)
```

Explanation: Accessing specific elements by label is crucial for analyzing and making decisions based on particular time periods or categories.

2. **Case Study:** A researcher has a Series of daily measurements and needs to extract data from the 3rd to the 5th day.

Question: How can the researcher use slicing on `measurements = pd.Series(range(10, 20))` to get the values from the 3rd to 5th positions? Write the code and explain the slicing technique.

```python
measurements = pd.Series(range(10, 20))

sliced_data = measurements[2:5]

print(sliced_data)
```

Explanation: Slicing helps in extracting a subset of data for focused analysis or visualization.

3. **Case Study:** An economist has a Series with quarterly GDP data and wants to compare the first and last quarter.

Question: How can the economist use both integer and label-based indexing on `gdp = pd.Series([1000, 1500, 2000, 2500], index=['Q1', 'Q2', 'Q3', 'Q4'])` to get the first and last values? Write the code and discuss the difference between these indexing methods.

```python
gdp = pd.Series([1000, 1500, 2000, 2500], index=['Q1', 'Q2', 'Q3', 'Q4'])
first_quarter = gdp.iloc[0]
last_quarter = gdp.loc['Q4']
print(first_quarter, last_quarter)
```

Explanation: Integer indexing (`iloc`) is used for positional access, while label-based indexing (`loc`) is used for accessing data by label.

4. **Case Study:** A teacher has a Series of student names and scores. They need to get scores for students whose names are 'Alice' and 'Charlie'.

Question: How can the teacher use label-based indexing on `scores = pd.Series([90, 85, 95], index=['Alice', 'Bob', 'Charlie'])` to get the scores for 'Alice' and 'Charlie'? Write the code and explain the process.

```python
scores = pd.Series([90, 85, 95], index=['Alice', 'Bob', 'Charlie'])
selected_scores = scores.loc[['Alice', 'Charlie']]
print(selected_scores)
```

Explanation: Label-based indexing allows for precise selection of data based on the index labels, useful in named datasets.

5. **Case Study:** A project manager has a Series of task durations and needs to find the tasks that took more than 5 days.

Question: How can the manager use boolean indexing on `durations = pd.Series([2, 5, 8, 6, 3], index=['Task1', 'Task2', 'Task3', 'Task4', 'Task5'])` to get tasks taking more than 5 days? Write the code and discuss the benefits.

```python
durations = pd.Series([2, 5, 8, 6, 3], index=['Task1', 'Task2', 'Task3', 'Task4', 'Task5'])
long_tasks = durations[durations > 5]
print(long_tasks)
```

Explanation: Boolean indexing filters data based on conditions, enabling easy identification of specific data points that meet certain criteria.

DATA HANDLING USING PANDAS- DATAFRAME

MCQs

1. Which attribute is used to get total number of elements in a Series?

   a. size b. itemsize

   c. shape d. ndim

2 To display last five rows of a series object **'S1'**, you may write:

   a. S1.Head() b. S1Tail(5)

   c. S1.Head(5) d. S1.tail()

1. To display top five rows of a series object **'S'**, you may write:

   a. S.head() b. S.Tail(5)

   c. S.Head(5) d. S.tail()

2. Which method in Pandas can be used to change the index of rows and columns of a Series or DataFrame:

   (i) rename() (ii) reindex() (iii) reframe() (iv) none of the above

3. In a Dataframe, axis = 0 is for:

   a. Columns b. Rows

   c Rows and Column d. None of these

4. Pandas Series is: _____

   a. 2-Dimensional b. 3-Dimensional c. 1 Dimensional d. Multidimensional

7. Python pandas was developed by:_____

   a. Guido van Rossum b. Travis Oliphant

   c. Wes McKinney d. Brendan Eich

8. The command to install the pandas is:

   a. install pip pandas b. install pandas

   c. pip pandas d. pip install pandas

9. The name "Pandas" is derived from the term:

   a. Panel Data b. Panel Series

c. Python Document d. Panel Data Frame

10. We can analyse the data in pandas with

    a. Series b. Data Frame

    c. Both of the above d. None of the above

11. Pandas is a: _____

    a. Package b. Language

    c. Library d. Software

12. Which of the following import statement is not correct?

    a. import pandas as CLASS12 b. import pandas as 1pd

    c. import pandas as pd1 d. import pandas as pd

13. Which of the following is not an attribute of pandas data frame?

    a. length b. T

    c. Size d. shape

14. Find the correct option as output of following code :

```
import pandas as pd
s=pd.Series([1,2,3,4,5], index=['aman','Atul','charu','Soumya','Sumera'])
print(s['charu'])
```

    a. 1 b. 2 c. 3 d. 4

15. Assuming the given series, named stud, which command will be used to print 5 as output?

```
Sumit    90
Rajesh   100
Mahesh   50
Adnan    67
Zeenat   89
Name: Student, dtype: int64
```

    a. stud.index b. stud.length

    c. stud.values d. stud.size

16. A social science teacher wants to use a pandas series to teach about Indian historical monuments and its states. The series should have the monument names as values and state names as indexes which are stored in the given lists, as shown in the code. Choose the statement which will create the series:

```
import pandas as pd
Monument=['Qutub Minar','Gateway of India','Red Fort','Taj Mahal']
State=['Delhi','Maharashtra','Delhi','Uttar Pradesh']
```

a. S=df.Series(Monument, index=State)

b. S=pd.Series(State, Monument)

c. S=pd.Series(Monument, index=State)

d. S=pd.series(Monument, index=State)

17. Difference between loc() and iloc().:

a. Both are Label indexed based functions.

b. Both are Integer position-based functions.

c. loc() is label-based function and iloc() integer position-based function.

d. loc() is integer position-based function and iloc() index position-based function.

18. Which attribute of dataframe is used to retrieve its shape

a. T b. Ndim

c. Empty d. Shape

19. Which attribute of dataframe is used to retrieve its axes

a. T b. Ndim

c. Empty d. Shape

20. Which attribute of dataframe is used to perform transpost operation on a dataframe

a. T b. Ndim

c. Empty d. Shape

ANSWERS

1. Size
2. s.tail()
3. s.head()
4. reindex()
5. Rows
6. 1. Dimensional
7. Wes McKinney
8. pip install pandas
9. Panel Data
10 Both of the above
11 Library
12 impoart pandas as pd
13. length
14. 3
15. stud.size
16. s=pd.Series(Monument,index=State)
17. loc() is label based function and iloc() integer position based function.
18. shape
19. Ndim
20. T

MLL Questions:

1. What is series?
2. Write a program to create a series to print scalar value “5” four times
3. Which attribute is used to get total number of elements in a Series?
4. Define DataFrame?
5. What are the different ways DataFrame is created?
6. Write a Python code to create a DataFrame stock with appropriate column headings from the

list given below:

[[101,'Geeta',98], [102,'Raju',95], [103,'Seema' ,96], [104,'Yash',88]]

7. How are Dataframe related to series?
8. What do you understand by the size of (1) Series , (ii) Dataframe
9. How can we fill missing values in DAtaFrame?
10. Which is the standard data missing marker used in Pandas?
11. What difference do we see in deleting with del and pop methods?
12. Which attribute is used to check if the series object contains NaN values?
13. What is a CSV files?
14. Which Pandas method is used to send content to a dataframe to CSV file?
15. Which Pandas method is used to read CSV Files?

MLL Questions ANSWERS

1. Series is a one dimensional structure with elements of homogeneous data.
2. import pandas as pd
   S=pd.Series(5, index=[1,2,3,4,5])
3. Size
4. It is a two dimensional data structure, just like any table. It is similar to spreadsheets or sql tables. Columns can be of deifferent types. Its size and values are mutable.
5. DataFrame can be create with the following construct :

   List, Series,Dictionary, Numpy ndarrays
6. import pandas as pd

   d=[[101,'Geeta',98],[102,'Raju',95],[103,'Seema' ,96],[104,'Yash',88]]

   c=['sno','Name','Score']

   stock=pd.DataFrame(d,columns=c)

   print(stock)
7. Dataframe and series both are datastructures in pandas library. The individual columns of a dataframe can be considered as a Series object.
8. Size attribute gives the number of elements present in Series or Dataframe.
9. For filling missing values, we can is fillna() method, for example

Df = fd1.fillna(0)

10. NaN

11. del method does not display the content of the column deleted where as pop() method deletes and

existing column as well as displays the content of the deleted column.

12 hasnans attribute is used.

13 CSV files is a type of plain text file . It stands for Comma Seperated Value. This is the simplest way to

store tabular data. It must be save with the .CSV extension. It can store text as well as number.

14. to_csv() method

15. read_csv() method

ASSERTION AND REASONING Based Questions:

Directions: In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as:

(A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false.

(D) Assertion (A) is false, but Reason (R) is true.

QUESTIONS:

1. Assertion(A) : DataFrame is a two-dimensional labelled array.
   Its columns types can be heterogeneous i.e., of varying types.
   Reason(R): We need a DataFrame with a Boolean index to use the Boolean indexing.
2. Assertion (A): Iteration is a general term for taking each item of something one after another.
   Reason (R): itertuples () returns the iterator yielding each index value along with a series containing the data in each row.
3. Assertion (A): Indexing can also be known as sub selection.

Reason (R): Pandas DataFrame.loc attribute access group of rows and columns by label(s) or a boolean array in the given DataFrame.

4. Assertion (A): To delete a column from Panda DataFrame, drop() method is used.
   Reason (R): Columns are deleted by dropping columns with index label.
5. Assertion (A): Rows can also be selected by passing integer location.
   Reason (R): Integer location can be pass to the iloc[] method
6. Assertion (A): head() function returns first n rows from the object based on position.
   Reason (R): n is the selected number of rows whose default value is 3.
7. Assertion (A): List of dictionary can be passed to form a DataFrame.
   Reason (R): Keys of dictionary are taken as row names by default.
8. Assertion (A): Indexing can also be known as sub selection.
   Reason (R): Pandas DataFrame.loc attribute access group of rows and columns by label(s) or a Boolean array in the given DataFrame.
9. Assertion (A): CSV files are available to open in any spreadsheet program, including Google Sheets, Open Office, and Microsoft Excel.
   Reason (R): Using a spreadsheet program can serve a user's needs better since it has cells where data sorted in rows and columns.
10. Assertion (A):- While creating a DataFrame with a nested or 2D dictionary, Python interprets the outer dict keys as the columns and the inner keys as the row indices.
    Reasoning (R):- A column can be deleted using remove command

TOPIC: Assertion & Reasoning

Answers

1. Option (C) is correct.
2. Option (C) is correct.
   Explanation: Iteration is the repetition of a process in order to generate an outcome. The sequence will approach some end point or end value. Each repetition of the process is a single iteration, and the outcome of each iteration is then the starting point of the next iteration. iterrows() returns the iterator yielding each index value along with a series containing the data in each row.
3. Option (D) is correct.

Explanation: Indexing can also be known as subse selection.

loc takes two single/list/range operator separated by 7. The first one indicates the row and the second one indicates columns.

4. Option (C) is correct.

   Explanation: To delete a column from Pandas DataFrame, drop() method is used. Columns are deleted by dropping columns with column names.

5. Option (B) is correct.

   Explanation: To retrieve rows from a DataFrame, a special method is used named DataFrame.loc[]. Rows can also be selected by passing integer location to iloc[] method.

6. Option (C) is correct.

   Explanation: head() function returns first n rows from the object based on position. It is useful for quickly verifying data. for example, after sorting Syntax, DataFrame.head(n = 5)

   Here, n is the selected number of rows whose default value is 5.

7. Option (C) is correct.

   Explanation: List of dictionary can be passed to form a DataFrame. Keys of dictionary are taken

8. Option (D) is correct.

   Explanation: Indexing can also be known as subse selection.loc takes two single/list/range operator separated by 7. The first one indicates the row and the second one indicates columns.

9. Option (A) is correct.

   Explanation: A CSV file stores data, both numbers and text in a plain text. All fields are separated by commas while all records are separated by an elaborate line of characters. A spreadsheet program sorts the data in a CSV file systematically via columns. This helps to filter all the contents in the file.

Option (C) is correct.

PRACTICE PROGRAMS

1. Create a pandas series from a dictionary of values and an ndarray.
2. Write a Pandas program to perform arithmetic operations on two Pandas Series.
3. Write a Pandas program to add some data to an existing Series.

4. Write a Pandas program to select the rows where the percentage greater than 70.
5. Write a Pandas program to select the rows the percentage is between 70 and 90 (inclusive)
6. Write a Pandas program to change the percentage in given row by user.
7. Replace all negative values in a data frame with a 0
8. Read the 'Student_result.csv' to create data frame and do the following operation:
   - To display Adm_No, Gender and Percentage from 'Student_result.csv' file.
   - To display first 5 and last 5 records from 'student_result.csv' file.
9. Read the 'Student_result.csv' to create data frame and do the following operation:
   - To display Student_result file with new column names.
   - To modify the Percentage of student below 40 with NaN value in dataframe.
10. Read the 'Student_result.csv' to create data frame and do the following operation:
   - To create a duplicate file for 'student_result.csv' containing Adm_No, Name and Percentage.
   - Write the statement in Pandas to find the highest percentage and also print the student's name and percentage.

SOLUTIONS OF PROGRAMS

1# Create a panda's series from a dictionary of values and a ndarray

```
import pandas as pd
import numpy as np
s=pd.Series(np.array([1,3,4,7,8,8,9]))
print(s)

#  create a dictionary
dictionary = {'X' : 10, 'Y' : 20, 'Z' : 30} #  create a series
series = pd.Series(dictionary)
print(series)
```

2#Write a Pandas program to perform arithmetic operations on two Pandas Series.

```
import pandas as pd
ds1 = pd.Series([3, 6, 9, 12, 15])
ds2 = pd.Series([2, 4, 6, 8, 10])
ds = ds1 + ds2
print("Add two Series:")
print(ds)
print("Subtract two Series:")
ds = ds1 - ds2
print(ds)
print("Multiply two Series:")
ds = ds1 * ds2
print(ds)
print("Divide Series1 by Series2:")
ds = ds1 / ds2
print(ds)
```

3# Write a Pandas program to add some data to an existing Series.

```
import pandas as pd
s = pd.Series(['S101', 'Amjad', 'C.Sc.', 'XII – A1', '450'])
print("Original Data Series:")
print(s)
print("\nData Series after adding some data:")
new_s = s.append(pd.Series(['90.0', 'PASS']))
print(new_s)
```

4# Write a Pandas program to select the rows where the percentage greater than 70.

```
import pandas as pd
import numpy as np
```

```
exam_data  = {'name': ['Aman', 'Kamal', 'Amjad', 'Rohan', 'Amit', 'Sumit', 'Matthew', 'Kartik',
'Kavita', 'Pooja'],    'perc': [79.5, 29, 90.5, np.nan, 32, 65, 56, np.nan, 29, 89],
        'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['A', 'B', 'C', 'B', 'E', 'F', 'G', 'H', 'I', 'J']
df = pd.DataFrame(exam_data , index=labels)
print("Number of student whoes percentage more than 70:")
print(df[df['perc'] > 70])
```

5# Write a Pandas program to select the rows the percentage is between 70 and 90 (inclusive)

```
import pandas as pd
import numpy as np
exam_data  = {'name': ['Aman', 'Kamal', 'Amjad', 'Rohan', 'Amit', 'Sumit', 'Matthew', 'Kartik',
'Kavita', 'Pooja'],   'perc': [79.5, 29, 90.5, np.nan, 32, 65, 56, np.nan, 29, 89],
        'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['A', 'B', 'C', 'B', 'E', 'F', 'G', 'H', 'I', 'J']
df = pd.DataFrame(exam_data , index=labels)
print("Number of student whoes percentage more than 70:")
print(df[df['perc'].between(70,90)])
```

6# Write a Pandas program to change the percentage in given row by user.

```
import pandas as pd
import numpy as np
exam_dic  = {'name': ['Aman', 'Kamal', 'Amjad', 'Rohan', 'Amit', 'Sumit', 'Matthew', 'Kartik',
'Kavita', 'Pooja'],  'perc': [79.5, 29, 90.5, np.nan, 32, 65, 56, np.nan, 29, 89],
        'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['A', 'B', 'C', 'B', 'E', 'F', 'G', 'H', 'I', 'J']
df = pd.DataFrame(exam_dic , index=labels)
print("\nOriginal data frame:")
print(df)
ch = input("Enter the index of row : ")
per = float(input("Enter percentage to be changed: "))
print('\nChange the percentage in row '+ch+ ' to',per)
```

```
df.loc[ch, 'perc'] = per
print(df)
```

7# Replace all negative values in a data frame with a 0.

```
import pandas as pd
data = {'sales1':[10,20,-4,5,-1,15],
'sales2':[20,15,10,-1,12,-2]}
df = pd.DataFrame(data)
print("Data Frame")
print(df)
print('Display DataFrame after replacing every negative value with 0')
df[df<0]=0
print(df)
```

8# Importing and exporting data between pandas and CSV file.
 # To create and open a data frame using 'Student_result.csv' file using Pandas.
 # To display row labels, column labels data types of each column and the dimensions
 # To display the shape (number of rows and columns) of the CSV file.

```
import pandas as pd
import csv
#Reading the Data
df = pd.read_csv("student_result.csv")
# Display Name of Columns
print(df.columns)
# Display no of rows and column
print(df.shape)
# Display Column Names and their types
print(df.info())
```

9# Read the 'Student_result.csv' to create a data frame and do the following operation:
 # To display Adm_No, Gender and Percentage from 'student_result.csv' file.
 # To display the first 5 and last 5 records from 'student_result.csv' file.

```
import pandas as pd
import csv
#To display Adm_No, Gender and Percentage from ‘student_result.csv’ file.
df = pd.read_csv("student_result.csv",usecols = ['ADM_NO','GENDER', 'PERCENTAGE'])
print("To display Adm_No, Gender and Percentage from ‘student_result.csv’ file.")
print(df)
#To display first 5 and last 5 records from ‘student_result.csv’ file.
df1 = pd.read_csv("student_result.csv")
print(df1.head())
print(df1.tail())
```

10# Read the ‘Student_result.csv’ to create a data frame and do the following operation:
 # To display Student_result file with new column names.
 # To modify the Percentage of student below 40 with NaN value in dataframe.

```
import pandas as pd
import numpy as np
import csv
df = pd.read_csv("student_result.csv")
print(df)
#To display Student_result file with new column names.
df1 = pd.read_csv("student_result.csv",skiprows = 1,
names = ['Adno','Sex','Name','Eng','Hin',
'Maths','Sc.','SSt','San','IT','Perc'])
print("To display Student_result file with new column names")
print(df1)
# To modify the Percentage of student below 40 with NaN value.
df2 = pd.read_csv("student_result.csv")
print(df2)
print("To modify the Percentage of student below 40 with NaN value.")
df2.loc[(df2['PERCENTAGE'] <40, 'PERCENTAGE')] = np.nan
print(df2)
```

OPERATIONS ON DATAFRAME

MCQs

Q1. **Amongst which of the following is / are not correct to access individual item from dataframe 'df'.**

a. df.iat[2,2]
b. df.loc[2,2]
c. df.at[2,2]
d. df[0,0]

Answer: D) df[0,0]

Q2**. Amongst which of the following is / are not an iterative function for dataframe?**

A. iterrows()
B. itercolumns()
C. iteritems()
D. All of the mentioned above

Answer: B) itercolumns()

Q3. **DF1.loc[ ] method is used to _____ . (Here# DF1 is a DataFrame)**

A. Add new row in a DataFrame 'DF1'
B. To change the data values of a row to a particular value
C. Both of the above
D. None of the above

Answer: C) Both of the above

Q4. **We can add a new row to a DataFrame using the _____ method**

A. rloc[ ]
B. loc[ ]
C. iloc[ ]
D. Both B & C

Answer: D) Both B & C

Q5. **The following code create a dataframe named 'D1' with _____ rows.**

```
import pandas as pd
LoD = [{'a':10, 'b':20}, {'a':5, 'b':10, 'c':20}]
D1 = pd.DataFrame(LoD)
```

A. 0
B. 1
C. 2
D. 3

Answer: C) 2

Q6. **In the following statement, if column 'Rollno' already exists in the DataFrame 'D1' then the assignment statement will _____**

D1['Rollno'] = [1,2,3] #There are only three rows in DataFrame D1

A. Return error
B. None of the above
C. Add new column
D. Replace the already existing values.

Answer: D) Replace the already existing values.

Q7. D1[:] = 77 , will set _____ values of a Data Frame 'D1' to 77.

A. None of the above
B. Only First Column
C. All
D. Only First Row

Answer: C) All

Q8. Display first row of dataframe 'DF'

A. print(DF.head(1))
B. print(DF[0 : 1])
C. print(DF.iloc[0 : 1])
D. All of the above

Answer: D) All of the above

Q9. To delete a row, the parameter axis of function drop( ) is assigned the value _____

A. 0
B. 1
C. 2
D. 3

Answer: A) 0

Q10. The following statement is _____ (#DF is a DataFrame)

>>> DF=DF.rename({'Maths':'Sub1','Science':'Sub2'}, axis='index')

A. altering the row labels
B. altering the column labels
C. altering the row and column labels (both)
D. Error

Answer: A) altering the row labels

Q11. Write a statement to delete column labelled as 'R1' of DataFrame 'DF'..

A. DF= DF.drop('R1', axis=0)
B. DF= DF.del('R1', axis=0)
C. DF= DF.drop('R1', axis=0, row = 'duplicate')

D. None of the above

Answer: D) None of the above

Q12. Given a Pandas DataFrame called df, the command which will display the last 4 rows is _____.

A. print(df.tail(4))
B. print(df.Tail(4))
C. print(df.tails(4)
D. print(df.Tails(4))

Answer: A) print(df.tail(4))

Q13. The parameter axis='index' of rename( ) function is used to specify that the _____

A. row and column label is to be changed
B. column label is to be changed
C. row label is to be changed
D. None of the above

Answer: C) row label is to be changed

Q14. Suppose a data frame Df1 contains information about student having columns rollno, name, class and section. Write the code for the following:
Add one more column as fee:

A. Df1['fee']=([100,200,300])
B. Df1.add['fee']= ([100,200,300])
C. Df1.AddNewCol['fee']= [100,200,300])
D. Df1.addnewcol['fee']= ([100,200,300])

Answer: A)

Q15. Write the code to remove duplicate row labelled as 'R1' from DataFrame 'DF1'

A. DF1 = DF1.drop('R1', axis = 0)
B. DF1 = DF1.drop('R1', axis = 1)
C. DF1 = DF1.del('R1', axis = 0)
D. DF1 = DF1.del('R1', axis = 1)

Answer: A)

Q16. What we are doing in the following statement?
dF1=dF1.append(dF2) #dF1 and dF2 are DataFrame object

A. We are appending dF1 in dF2
B. We are appending dF2 in dF1
C. None of the above
D. We are creating Series from DataFrame

Answer: B)

Q17. Display data of 1st to 3rd rows

A. DF1.iloc[1:4]
B. data.iloc[1:4]
C. dataofDf1.iloc[1:4]
D. None of the above

Answer: A)

Q18. Write a statement to delete a column having column label as 2017 in DataFrame 'DF'

A. print(DF.drop(2017,axis=0))
B. print(DF.drop(2017,axis=1))
C. print(DF.drop('2017',axis=1))
D. All of the above

Answer: B)

Q19. Consider a code:

df=pd. DataFrame([2, 4, 5, 9] , index= [True, False, False, True])
Which of the following is used to create the above dataframe?

A. Created using Series
B. Created using List of Dictionary
C. Created using Boolean indexing
D. Created using Strings

Answer: C)

Q20. Display the marks of Karan in all Subjects:

A. print(DF.loc['Science' : 'English', 'Karan'])
B. print(DF['Karan'])
C. Both of the above
D. None of the above

Answer: B)

MLL Questions:

Q1. _____Method is used to rename the existing indexes in a data frame.

Ans: Rename

Q2. _____**Attribute that can prohibit to create a new data frame insort_values() method.**

Ans: Inplace

Q3. Write a python program to create a data frame with headings (CS and IP) fromthe list given below-

[[79,92][86,96],[85,91],[80,99]]

AnS

```
l=[[10,20],[20,30],[30,40]]
df=pd.DataFrame(l,columns=['CS','IP'])
print(df)
```

Q4. What will be the output of following code?

```
import pandas as pd
df = pd.DataFrame([45,50,41,56], index = [True, False,True, False])
print(df.iloc[True])
```

Ans: It will display error message like- Cannot index by location index with a non-integer key **because iloc accept only integer index.**

Q5. Hitesh wants to display the last four rows of the dataframe df and has writtenthe following code:

df.tail()

But last 5 rows are being displayed. Identify the error and rewrite the Correct code so that last 4 rows get displayed

Ans: If tail() doesn't receive any argument, then by default last 5 rows will Be displayed. Correct Code is: df.tail(4)

Q6. Write the command to add a new column in the last place(3rd place) named "Salary" from the list of values, Sal=[10000,15000,20000] in an existing dataframe named EMP, assume already having 2 columns.

Ans: EMP['Salary']=Sal

Q7. Write a small python code to drop a row from dataframe labeled as 0.

Ans: df=df.drop(0)

Q8. Write a python code to create a dataframe with appropriate headings from thelist given below:

['S101', 'Amy', 70], ['S102', 'Risha', 69], ['S104', 'Susan',75], ['S105','George',82]

ANS –

```
import pandas as pd
L=[['S101','Amy',70], ['S102','Risha',69], ['S104','Susan',75], ['S105','George',82]]
df=pd.DataFrame(L,index=[1,2,3,4],columns=['ID','Name','Points'])
print(df)
```

Q9. Find the output of the following code:

```
import pandas as pd
data = [{'a': 10, 'b': 20},{'a': 6, 'b': 32, 'c': 22}]
df1=pd.DataFrame(data,columns=['a','b'])
```

```
df2 = pd.DataFrame(data,columns=['a','b1'])
print(df1)
print(df2)
```

ANS:

```
   a   b
0  10  20
1  6   32
   a   b1
0  10  NaN
1  6   NaN
```

Q10. To change index label of df1 from 0 to zero and from 1 to one.

Ans: df1=df1.rename(index={0:'zero',1:'one'})

Q11. To subtract df2 from df1

Ans: print(df1.sub(df2))

Q12. Write python statement to delete the 3rd and 5th rows from dataframe df.

Ans: df1=df.drop(index=[2,4],axis=0)or df1=df.drop([2,4])

Q13. To sort df1 by Second column in descending order.

Ans:df1=df1.sort_values(by='Second',ascending=False)

Q14. To change the index of df2 from 0,1,2,3 to a,b,c,d

Ans: df2=df2.rename(index={0:'a',1:'b',2:'c',3:'d'})

Q15. To display those rows in df1 where value of third column is more than 45.

Ans: print(df1[df1['Third']>45])

Q16. Write a small python code to add a row to a dataframe.

Ans:

```
import pandas as pd
student_df=pd.DataFrame({'Name':['Ananmay','Aditi','Mehak','Kriti'],
'Class':['XI','XI','XI','XI'],'Marks':[95,82,65,45]},index=[1,2,3,4])
data={'Name':'Sohail','Class':'XII','Marks':77}
newstd=pd.DataFrame(data,index=[5])
student_df=student_df.append(newstd)
```

Q17. Jitesh wants to sort a DataFrame df. He has written the following code.

```
df=pd.DataFrame({"a":[13, 24, 43, 4],"b":[51, 26, 37, 48]})
print(df)
df.sort_value(a')
```

print(df)

He is getting an output which is showing original DataFrame and not the sorted DataFrame. Identify the error and suggest the correction so that the sorted DataFrame is printed.

Ans: The possible reason is that the original dataframe is notmodified. The correct answer is: df.sort_values('a',inplace=True)

Q18. Consider a DataFrame 'df' created using the dictionary given below, answer the questions given below:

exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael','Matthew', 'Lara', 'Kevin', 'Jonas'],'score': [12.5, 9, 16.5, np.NaN, 9, 20,14.5, np.NaN, 8, 19],'attempts' : [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],qualify': ['yes','no','yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}

Write command to remove the rows having NaN values.

ANS - df=df.dropna()

Q19. Consider the following DataFrame df and answer the questions given below:

	A	B	C	D
0	12	5	20	14
1	4	2	16	3
2	5	54	7	17
3	44	3	3	2
4	1	2	8	6

(a) Write command to change the indices to 'zero','one','two',three' and 'four' respectively.

ANS df=df.rename(index={0:'Zero',1:'One',2:'Two',3:'Three'})

(b) Write a Python Code to print the dataframe in the descending order of Salary.

Ans: df=df.sort_values(by='Salary',ascending=False)
print(df)

ASSERTION AND REASONING Based Questions:

Q1. Assertion (A) :D**ataframe is size mutable and value mutable**

Reason (R): **the axis = 1 identifies the column index of dataframe**

- **a.** Both A and R are true and R is the correct explanation of A.
- **b.** Both A and R are true but R is not the correct explanation of A.
- **c.** A is true but R is false.
- **d.** A is false but R is true.

Ans:

Q2. Assertion (A): DataFrame.count() function will display the sum of the values from the data frame.

Reason (R): axis=0 ,argument is to used to find sum column-wise.

a. Both A and R are true and R is the correct explanation of A.
b. Both A and R are true but R is not the correct explanation of A.
c. A is true but R is false.
d. A is false but R is true.

Ans: d

Q3. Assertion (A): Nidhi has create dataframe Df1. She can expand or delete any row / column in this dataframe.

Reason(R): In python DataFrame objects can be concatenated or merged

a. Both A and R are true and R is the correct explanation of A.
b. Both A and R are true but R is not the correct explanation of A.
c. A is true but R is false.
d. A is false but R is true.

Ans: b

Q4. Assertion (A): Boolean indexing is a type of indexing.

Reasoning (R) : DataFrame.loc(False) function can be used to find the relative values where index value is False.

a. Both A and R are true and R is the correct explanation of A.
b. Both A and R are true but R is not the correct explanation of A.
c. A is true but R is false.
d. A is false but R is true.

Ans: a

Q5. Assertion (A): Sorting is the operation to arrange data in a specific order , sort_values() function used to perform the operation.

Reasoning (R): Row wise sorting cannot be performed in python dataframe objects.

a. Both A and R are true and R is the correct explanation of A.
b. Both A and R are true but R is not the correct explanation of A.
c. A is true but R is false.
d. A is false but R is true.

Ans:b

Q6. Assertion (A):- DataFrame has both a row and column index.

Reasoning (R): - A DataFrame is a two-dimensional labelled data structure like a table of MySQL.

a. Both A and R are true and R is the correct explanation of A.
b. Both A and R are true but R is not the correct explanation of A.
c. A is true but R is false.
d. A is false but R is true.

Ans: b

Q7. Assertion (A) Elements of Series can be accessed using positional index. [1]
Reason (R) Positional index values ranges from 1 to n, if n is the size of the series.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are ture but R is not the correct explanation of A
(c) A is true but R is false.
(d) A is false but R is true.
Answer: (C) Elements of the series can be accessed using positional index, positional index values start from 0 and it ranges from 0 to n-1, if n is the size of the series. Hence, A is true but R is false.

Q8. Assertion (A) : The output of addition of two series will be NaN, if one of the elements or both the elements have no value(s).
Reason (R) : While performing mathematical operations on a series, by default all Missing values are filled in with 0.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A
(c) A is true but R is false.
(d) A is false but R is true.
Answer : b

Q9. Assertion (A). To use the Pandas library in a Python program, one must import it.
Reasoning (R). The only alias name that can be used with the Pandas library is pd.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A
(c) A is true but R is false.
(d) A is false but R is true.
Answer: c

Q10. Assertion. A dataframe is value mutable and size-mutable.
Reason. All changes occur in-place in a dataframe.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A
(c) A is true but R is false.
(d) A is false but R is true.

Answer: c

Q11. Assertion. Arithmetic operations on two series objects take place on matching indexes.
Reason. Non-matching indexes are removed from the result of arithmetic operation on series objects.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A
(c) A is true but R is false.

(d) A is false but R is true.

Answer: c

Q12. Assertion. While changing the values of a column in a dataframe, if the column does not exist, an error occurs.

Reason. If values are provided for a non-existing column in a dataframe, a new column is added with those values.

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A
(c) A is true but R is false.
(d) A is false but R is true.

Answer: d

Q13. Assertion. .loc() is a label based data selecting method to select a specific row(s) or column(s) which we want to select.

Reason. .iloc() can not be used with default indices if customized indices are provided.

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A
(c) A is true but R is false.
(d) A is false but R is true.

Answer : c

Q14. Assertion. DataFrame has both a row and column index.

Reason. A DataFrame is a two-dimensional labelled data structure like a table of MySQL.

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A
(c) A is true but R is false.
(d) A is false but R is true.

Answer : a

Q15 Assertion. In a dataset, there can be missing values that cannot contribute to any computation.

Reason. In a dataset, NULL, NaN or None are considered the missing values.

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A
(c) A is true but R is false.
(d) A is false but R is true.

Answer : a

CASE STUDY BASED Questions:

Q1 Consider the DataFrame 'Df1' given below and answer the questions from Q1 to Q6.

HR Department of ABCTech has created following dataframe Df1 to store data about salaries and bonus paid to their employees:

```
import pandas as pd
import numpy as np
d1={'EName':['Kavita','Sudha','Garima']],'Sal':[50000,60000,55000], 'Bonus':[3000,4000,5000]}
Df1=pd.DataFrame(d1)
```

Choose the python statement using suitable functions for the following tasks:

(a) Display the columns Sal and Bonus
(b) Display the details of employee Kavita.
(c) Display the details of the last employee.
(d) Add a new column named 'Email' with the value abc@gmail.com
(e) Write a python statement to print the details of employees having Sal more than 50000.
(f) Display the details of the first employee.

Q2. Consider the DataFrame 'DF' given below and answer the questions from Q 7 to Q 10.
Following DataFrame 'DF' containing Name, City, Email and Fees.
Python DataFrame 'DF'.

	Name	City	Email	Fees
0	Aksh	Ahmedabad	aksh123@gmail.com	15000
1	Bhavin	Baroda	bhavin000@gmail.com	25000
2	Charu	Surat	charu123@gmail.com	12000
3	Dhara	Anand	dhara174@gmail.com	11000

Q A. To display 2 rows from the top in the dataframe.
QB. df.index properties can be used to
QC Which of the following statement(s) is/are correct with respect to df.columns properties to rename columns
1. All columns must be specified
2. Columns must be in the form of a list
3. Old column names not required
4. Columns can be specified with columns number
Q D. To rename city columns to location using rename() function

Q3. Sanyukta is the event incharge in a school. One of her students gave her a suggestion to use Python Pandas andMatplotlib for analysing and visualising the data, respectively. She has createda Data frame "SportsDay" to keeptrack of the number of First, Second and Third prizes won by different houses in various events.Write Python commands to do the following:

i.Display the house names where the number of Second Prizes are in the range of 12 to 20.
ii.Display all the records in the reverse order.
iii.Display the bottom 3 records.
iv.Give output of :

```
x=df.columns[:1]
print(x)
```

v. Which command will give the output 24

Q4. Pushp, a student of class-XII, has been assigned a code to create a panda series S1, as shown below.

```
a      100
b      200
c      300
d      400
e      500
dtype: int64
```

With reference to the above answer given questions:

i. Write the command that will give the following Output as:

```
b      200
c      300
dtype: int64
```

ii. Help him to write the correct statement that can be used to extract the value with the index 'c.

iii. Which command will display the series by adding 10 in each value.

iv. Pushp wants to delete the value against index 'd', give code for him.

Q5. Zeenat has created the following dataframe dataframe1 to keep track of data Rollno, Name, Marks1 andMarks2 for various students of her class where row indexes are taken as the default values:

Rollno	Name	Marks1	Marks2
1	Swapnil Sharma	30	50
2	Raj Batra	75	45
3	Bhoomi Singh	82	95
4	Jay Gupta	90	95

Q I. Which among the following option will give 90, 95 as output

a) print(max(dataframe1['Marks1','Marks2'])

b) print((dataframe1.Marks1.max(),(dataframe1.Marks2.max())))

c) print(max(dataframe1['Marks1'])

d) print(max(dataframe1['Marks2'])

Answer: (b) print((dataframe1.Marks1.

QII. She needs to know the marks scored by Rollno 2. Help her to find it.

QIII. Write a code to will delete the 3rd column.

QIV. Write the command which will display the total number of elements in the dataframe?

QV. Now she wants to add a new column Marks3 with relevant data. Help her to perform this task.

Q6. Naman has created the following dataframe "Climate" to record the data about climatic conditions of four years.

Year	MaxTemp	MinTemp	Rainfall
2017	32	20	123
2018	33	22	140
2019	35	21	135
2020	34	23	160

i. Which of the code snippets will return the MaxTemp and Rainfall for year 2018 And 2019?
ii. Display the temperature difference between MaxTemp and MinTemp for all the rows in the dataframe Climate.
iii. To display 2 rows from the top in the dataframe.
iv. Which of the following statement/s will give the exact number of values in each column of the dataframe?
v. To display 2 rows from the bottom in the dataframe.

Q7. Jacqueline has created the following DataFrame consisting of data of houses of a school and the number of boys in the houses, shown as follows. She wants to perform certain operation on the data set. Help her with the correct actions.

House

Index	Housename	Location	Boys
0	Ganga	East	20
1	Yamuna	West	30
2	Saraswathi	North	56

(a) What will be the output of the following code?
(i) print(House.shape)
(ii) House.pop("Location")
print(House)
(B) She wants the "Housename" column to be the index of the DataFrame. What statement she should write? '
(c) To display total number of elements in the dataframe.
Or (Option for part (c) only)
She wants to see the number of columns. Write the statement which will display the number of columns.

Q8. Consider the following Data Frame 'mdf'.

	ROLL NO	Name	English	Hindi	Maths
0	1	Aditya	23	20	28
1	2	Balwant	18	1	25
2	3	Chirag	27	23	30
3	4	Deepak	11	3	7
4	5	Eva	17	21	24

(a) Write Python statements for the Data Frame 'mdf':
(i) To display the records of the students having roll numbers 2 and 3.
(ii)To increase the marks of subject Math by 4, for all students.
(iii)Write Python statement to display the Roll no and Name of all students who secured less than 10 marks in Maths.
OR
(Option for Part B only)
Write Python statement to display the total marks i.e., sum of marks secured in English, Hindi and Maths for all students.

Q9. Mr. Ankit is working in an organisation as data analyst. He uses Python Pandas and Matplotlib for the same. He got a dataset of the passengers for the year 2010 to 2012 for January, March and December. His manager wants certain information from him, but he is facing some problems. Help him by answering few questions given below: Code to create the above data frame:

```
import pandas as _____ #Statement1
data={"Year":[2010,2010,2012,2010,2012],"Month":["Jan","Mar","Jan","Dec","Dec"],
"Passengers":[25,50,35,55,65]}
df=pd._____(data)  #Statement 2
```

print(df)

i. Choose the right code from the following for statement 1.

i. pd ii. Df iii. Data iv. P

Answer: (i) pd

ii. Choose the right code from the following for the statement 2.

i. Dataframe ii. DataFrame iii. Series iv. Dictionary

Answer: (ii) DataFrame

iii. Choose the correct statement/ method for the required output:(5,3)

i. df.index ii. df.shape() iii. df.shape iv. df.size

Answer: (iii) df.shape

iv. He wants to print the details of “January” month along with the number of passengers, Identify the correct statement:

i. df.loc[[‘Month’,’Passengers’]][df[‘Month’]==’Jan’]
ii. df[[‘Month’,’Passengers’]][df[‘Month’]==’Jan’]
iii. df.iloc[[‘Month’,’Passengers’]][df[‘Month’]==’Jan’]
iv. df([‘Month’,’Passengers’]][df[‘Month’]==’Jan’)

Answer: (ii) df[[‘Month’,’Passengers’]][df[‘Month’]==’Jan’]

v. Mr. Ankit wants to change the index of the Data Frame and the output for the same is given below. Identify the correct statement to change the index.

i. df.index[]=[“Air India”,”Indigo”,”Spicejet”,”Jet”,”Emirates”]
ii. df.index[“Air India”,”Indigo”,”Spicejet”,”Jet”,”Emirates”]
iii. df.index=[“Air India”,”Indigo”,”Spicejet”,”Jet”,”Emirates”]
iv. df.index()=[“Air India”,”Indigo”,”Spicejet”,”Jet”,”Emirates”]

Answer: (iii) df.index=[“Air india”,”Indigo”,”Spicejet”,”Jet”,”Emirates”]

IMPORTING / EXPORTING DATA BETWEEN DATAFRAME AND CSV FILE

MCQs

1. A CSV file can take character as separator.
(a), (b) - (c) I (d) \t (e) only (a) (f) all of these

2. The correct statement to read from a CSV file in a dataframe is :
(a) <DF>.read_csv(<file>)
(b) <File>. read_csv( )(<DF>)
(c) <DF> = pandas.read(<file>)
(d) <DF> = pandas.read_csv(<files>)

3. Which argument do you specify with read_csv( ) to specify a separator character ?
(a) character
(b) char
(c) separator
(d) sep

4. To suppress first row as header, which of the following arguments is to be given in read_csv( ) ?
(a) noheader = True
(b) header = None
(c) skipheader = True
(d) header - Null

5. To read specific number of rows from a CSV file, which argument is to be given in read_csv( ) ?
(a) rows = <n>
(b) nrows = <n>
(c) n_rows - <n>
(d) number_rows = <n>

6.To skip first 5 rows of CSV file, which argument will you give in read_csv( ) ?

(a) skip_rows = 5
(b) skiprows = 5
(c) skip - 5
(d) noread - 5

7. To skip 1st, 3rd and 5th rows of CSV file, which argument will you give in read_csv( ) ?
(a) skiprows = 11315
(b) skiprows - (1, 3, 5]

(c) skiprows = [1, 5, 1]
(d) Any of these

8. While reading from a CSV file, to use a column's values as index labels, argument given in read_CSV( ) is :
(a) index
(b) index_col
(c) index_values
(d) index_label

9. Nowadays for developing Machine learning projects programmers rely on CSV files rather than databases. Why?
(a) csv can be used with proprietary softwares only.
(b) cSv files can be downloaded from open source websites free of cost.
(c) csv files need not be imported while creating the projects
(d) csv is a simple and well formatted mode for data storage

10. Which of the following is not a parameter (argument) of read_csv() method?
a. sep b. names c. header d. sort

11. Raju want to make a dataframe ‘saledata’ based on data of sale.csv which is stored in folder ‘Python’ in C: drive. What code he should write for it?

    a. Saledata = pd.read_csv(“sale.csv”)|
    b. Saledata = pd.read_csv(“C:/Python/sale.csv”)
    c. Saledata = pd.to_csv(“C:/Python/sale.csv”)
    d. All of the above

12. (i)_____ attribute used with read_csv() to import selective records/rows in dataframe
    (ii)_____ attribute used with read_csv() to specify the number of row whose values are to be used as column names.

    a. (i) nrows, (ii) names
    b. (i) rows, (ii) pos
    c. (i) nrows, (ii) header
    d. (i) head, (ii) nrows

13. Attribute used to specify the separator character for values being imported in dataframe using read_csv()

a. Sepatator
b. Sep
c. Sepies
d. Space

14. Write code to read data from CSV file student.csv stored in C: in dataframe ‘std’ including exculsive columns rollno, name, percent where all values are separated by semicolon ‘:’.

a. Std = pd.read_csv(“C:\student.csv”, sep = ‘;’, names = [‘rollno’,’name’,’percent’])
b. Std = pd.read_csv(“C:\student.csv”, sepies = ‘;’, names = (‘rollno’,’name’,’percent’))
c. Std = pd.read_csv(“C:\student.csv”, sep = ‘;’, header = [‘rollno’,’name’,’percent’])
d. Std = pd.read_csv(“C:\student.csv”, sepies = ‘;’, columns = [‘rollno’,’name’,’percent’])

15. Which of the following attribute should be taken to import first 10 rows in a dataframe from CSV?

a. Nrows = 10
b. Rows = 10
c. Skiprows = 10
d. Head = 10

16. You need to import CSV package in order to store a DataFrame in a CSV file.

a) True b) False

17. Write command to store data of DataFrame mdf into a CSV file Mydata.csv, with separator character as '@'……

18. A CSV file is also known as a _____.

a) Flat File b) 3D File c) String File d) Random File

19. The data of any CSV file can be shown in which of the following software?
(a) MS Word (b) Notepad (c) Spreadsheet (d) All of the above

20. Nowadays for developing Machine learning projects programmers rely on CSV files rather than databases. Why?
(a) csv can be used with proprietary softwares only.
(b) cSv files can be downloaded from open source websites free of cost.
(c) csv files need not be imported while creating the projects
(d) csv is a simple and well formatted mode for data storage

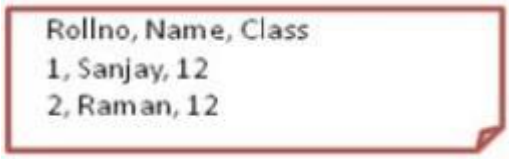
MLL Questions:

1. The data of any CSV file can be shown in which of the following software?
(a) MS Word (b) Notepad (c) Spreadsheet (d) All of the above

2. Tabular data that saved as plain text where data values are separated by commas

   a. Dataframe b. CSV c. MySQL d. All of the above

3. Look at this image and identify the file type



   a. MySQL
   b. Dataframe
   c. CSV
   d. Excel

4. Select the INCORRECT statement

   a. CSV files occupies less memory space
   b. CSV files are easy to read and write manually
   c. CSV files are compatible only with spreadsheet
   d. Data value of CSV files can be separated by any delimiter like comma/semicolon/space/tab.

5. All individual rows of CSV files are called

   a. Tuple b. Data c. Record d. Cardinality

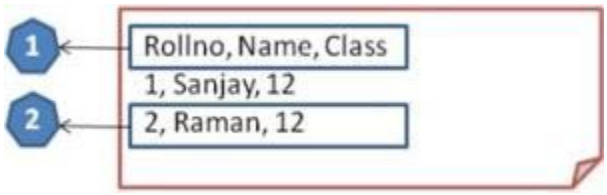
6. CSV files are text files

   a. True
   b. False

7. CSV file can also be considered as Binary files

   a. True b. False c. Sometimes d. Not sure

8. Look at the anatomy of CSV file and select correct abbreviation for 1 and 2



a. Attributes, 2. Rows
b. Columns, 2. Data
c. Degree, 2. Record
d. Header, 2. Record

9. Which of the following is not relavent to CSV files?

a. Smaller in size
b. Human readable
c. Easy to parse
d. Test and numeric data are distinct

10. Default delimeter in CSV is

a. ;
b. :
c. I
d. ,

11. A CSV file can take _____ as delimeter

a. ;
b. |
c. \t
d. @
e. All of the above

12. To read data from CSV file in pandas dataframe _____ method is used.

a. read_csv() b. to_csv() c. reader() d. writer()

13. _____ method saves data of dataframe to CSV file.

a. read_csv()
b. to_csv()
c. reader()
d. writer()

14. Rama want to make a dataframe ‘saledata’ based on data of sale.csv which is stored in folder ‘Python’ in C: drive. What code she should write for it?

    a. Saledata = pd.read_csv(“sale.csv”)|
    b. Saledata = pd.read_csv(“C:/Python/sale.csv”)
    c. Saledata = pd.to_csv(“C:/Python/sale.csv”)
    d. All of the above

15. If you want to read top 20 rows of data from CSV file, which argument would you give to read_csv()?

    a. Rows
    b. Nrows
    c. Header
    d. Head

ASSERTION AND REASONING Based Questions:

ASSERTION AND REASONING based questions. Mark the correct choice as

i. Both A and R are true and R is the correct explanation for A
ii. Both A and R are true and R is not the correct explanation for A
iii. A is True but R is False
iv. A is false but R is True

1. Assertion (A): - The acronym CSV is a short form for Comma Separated Values, which refers to a tabular data saved as plain text where data values are separated by commas. Data can be imported to a Dataframe from csv file.

Reasoning (R):- If we have the data in a CSV file, we can import the data. But, Python’s Pandas library must be imported to the program.

2. **Assertion(A) :** Only database can support import/export to CSV format.
Reasoning (R) : CSV file can be created and edited using any text editor

3. **Assertion(A)** : All the columns of CSV file can be separated by comma ‘ , ‘ or other delimiter.
Reasoning (R) : CSV is a short form for Comma Separated Values, which refers to a tabular data saved as plain text where data values are separated by commas only.

4. **Assertion(A)** Python Panda library offers functionality to interact with a CSV file.

Reasoning (R) : Panda's read_csv() and to_csv() functions can read-

from and write-to CSV files.

5. **Assertion.** The read_csv() function of Python Pandas can read data of a csv file into any of pandas data structures.

   Reasoning(R). DataFrame is a compatible data structure for

   read_csv() function.

6. **Assertion(A)** The read_csv() function reads a csv file's data into a DataFrame.

   Reasoning(R) : The to_csv() function writes a DataFrame on to a csv file.

7. Assertion(A) : By default, read_csv() uses the values of first row as column headers in DataFrames.

   Reasoningg(R) : header argument is given to ensure that the top/first row's data is used as data and not as column headers.

8. Assertion(A) : The `nrows` argument can be used to read only the top 10 rows of data from a CSV file using the `read_csv()` function in pandas. Reasoning(R) : The `nrows` argument specifies the number of rows of the file to read.

9. Assertion(A) : CSV is a short form for Comma Separated Values files , occupies less memory space .
   Reasoning(R) : CSV files which refers to a tabular data saved as plain text.

10. Assertion (A): CSV (Comma Separated Values) is a file format for data

    storage which looks like a text file.
    Reason (R): The information is organized with one record on each line
    and each field is separated by comma.
11. Assertion(A) : We can read specific rows from the csv files.
    Reasoning(R) : The nrows attribute is used to read specific rows from the CSV files.
12. Assertion(A) : Pandas is a library of python.
    Reasoning(R) : We import pandas and import and export data between dataframe and csv files.
13. Assertion (A):- CSV (Comma Separated Values) is a file format for data

    storage which looks like a text file.
    Reasoning (R):- A csv file is a two-dimensional labelled data structure like a table of MySQL.
14. Assertion(A) : There are two functions we would use to read data and write data to and from a CSV file into a DataFrame.
    Reasoning(R) : The function used to read data from a CSV file into a DataFrame is `read_csv()` . The function used to fetch data from an SQL table into a DataFrame is `read_sql()` .
15. Assertion(A) : CSV stands for comma separated value file.

    Reasoning(R) : A CSV file can not take other delimiter.

CBT Questions:

1. To create dataframe T from following csv file temp.csv stored in c drive, which of the following code is correct?

state	maxtemp	mintemp
mp	26	2
up	24	0
jk	12	-4

a. T = pd.read_csv("c:\temp.csv")
b. T = pd.read_csv("c:\temp.csv",sep = " ")
c. T = pd.read_csv("c:\temp.csv", sep = "\n")
d. T = pd.read_csv("c:\temp.csv", sep = "\t")

2. Select appropriate code to export all data of dataframe df to csv file temp.csv located in c drive excluding row labels.

a. df.to_csv("C:\temp.csv")
b. df.to_csv("C:\temp.csv", index = False)
c. df.to_csv("C:\temp.csv", header = False)
d. None of the above

3. In order to work with CSV files from panda, you need to import ..... , other than pandas.

1. .csv
2. pandas.io
3. newcsv
4. no extra package required

4. The correct statement to read from a CSV file in a DataFrame is :

1. <DF>.read_csv(<file>)
2. <File>. read_csv( )(<DF>)
3. <DF> = pandas.read(<file>)

4. <DF> = pandas.read_csv(<files>)

5. To suppress first row as header, which of the following arguments is to be given in read_csv() ?

1. noheader = True
2. header = None
3. skipheader = True
4. header = Null

6. Identify the function which can save dataframe df into csv file.
(i) df.write_csv() (ii) df.store_csv() (iii) df.to_csv() (iv) df.create_csv()

7. To skip first 5 rows of CSV file, which argument will you give in read_csv() ?

1. skiprows = 5
2. skip_rows = 5
3. skip = 5
4. noread = 5

8. To skip 1st, 3rd and 5th row of CSV file,which argument will you give in read_csv() ?

1. skiprows = 1 | 13 | 5
2. skiprows = [1, 5, 1]
3. skiprows = [1, 3, 5]
4. any of these

9. The data of CSV files can be shown in which of the following software?
a Spreadsheet software only
b Spreadsheet Software and Text Editor
c Text Editors only
d Any software

10. Which of the following advantage motivates to use CSV files over database transfer?
a CSV a common format for data interchange
b Nearly all spreadsheets and databases support import/export to CSV format
c No need to learn or remember any database command or any other tools
d A simple, common, and ubiquitous for data storage

CASE STUDY BASED Questions:

1. Write a program to read all content of "student.csv" in a dataframe and display records of only those students who scored more than 80 marks. Records stored in students is in format : Rollno, Name, Marks

2. For given sale.CSV located in C:\invetory

```
ID, Name, Jan, Feb, Mar
1, Ram kumar, 45, 78, 89
2, Suraj singh, 76, 45, 81
3, Jai Shankar, 45, 80, 66
4, sulekha rani, 67, 43, 56
5,jeevan, 66,77, 88,99
```

Shivangi want to create dataframe 'Sales' as given below

	0	1	2	3	4
0	1	Ram kumar	45	78	89
1	3	Jai Shankar	45	80	66
2	4	Sulekha rani	67	43	56

Help her to write correct code to do so.

3. Write a program to read from CSV file "c:\python\data.csv" where the delimeter is @ with following conditions
(i) Give exclusive column names as col1, col2, col3
(ii) First row should be taken as data and not as column headers

4.For given dataframe book

	Bcode	Bname	Author	Price
0	B1	C++	Ravichanran	200
1	B2	C	Kanitkar	180
2	B3	ETC	Kennedy	230

Write a program to create csv file lib.csv with columns bname and price.

5. Ms Priya is working on an application made in python. She wrote the command tp customize the column header but getting an error . Provide her the solution for the same and also give the explanation.

Df = pd.read_Csv(“adm.csv”,columns=[“AdmNo”,”FirstNAme”,”LAstNAme”,”Class”])

6.Mr Prakash has created a csv file to store the students details with header rows. While reading data from csv file into the dataframe he wants to hide the header from the csv file. He has written the following code but getting an error.:

Df= pd.read_csv(“d://adm.csv”,header=”no”)

Provide him the solution for the same and also give the explanation.

7. Ms Smita wants to write the following data in similar pattern in csv file (separated each by * and ignore default index). Help her to do the same.

SNO Name Score Rank

1 Sachin 345 1

2 Manish 300 3

3 Saurabh 250 4

8. Write a program to read data from a CSV file where separator character is '@'. Make sure that :

- the top row is used as data, not as column headers.
- only 10 rows are read into DataFrame.

Let the contents of the file `bike.csv` be the following:

Let the contents of the file bike.csv be the following:

Honda@2500

Yamaha@2800

Suzuki@2100

Kawasaki@3200

Ducati@3500

BMW@4500

Harley-Davidson@5500

KTM@4000

Triumph@5300

Aprilia@4800

Indian@5700

Royal Enfield@3000

9. Ms. Payal wants to create a CSV file from another CSV file. The file contains 5 columns EmpName, EmpId, Salary, Designation, DOB. Payal wants to read first three rows from the file. She has found the code to do the task she wants , but one line of code is missing. Help her to complete the code.

```
import pandas as pd
df = pd.read_csv("E:\\Data\\Employee.csv")
df.to_csv("E:\\Data\\Emp.csv", _____)
```

10. Write a program that reads from a CSV files where the separator character is '#'.Read only first 5 rows in your dataframe.
i. Give column headings as EmpName, Designation, Salary.
ii. Make sure to read first row as data and not as column headers.

11. Write a program to show the detail of the student who scored the highest marks. Rama stored the students details in "Data.csv" in given below :

```
Rollno, Name, Marks
1,      Aman, 35
2,      Kanak, 1
3,      Anuj, 33
4,      suman, 25
```

Help her to show the detail of the student who scored the highest marks by importing this data in a dataframe.

12. Amit, a student of class 12th is trying to write a program to search the record from "data.csv" according to the admission number input from the user. Structure of record saved in "data.csv" is Adm_no, Name, Class, Section, Marks.

13. Rohit, a student of class 12th, is learning CSV File Module in Python. Help him to show the detail of the student who are class XI by importing this data in a dataframe.

CSV File

```
1,AKSHAY,XII,A
2,ABHISHEK,XI,A
3,ARVIND,XII,A
4,RAVI,XII,A
```

5,ASHISH,XI,A

14. Write a program to read data from a CSV file where separator character is ';'. Make sure that :

- the top row is used as data, not as column headers.
- only 5 rows are read into DataFrame.

Let the contents of the file std.csv be the following:

1 , AKSHAY , XII , A
2 , ABHISHEK , XII , A
3 , ARVIND , XII , A
4 , RAVI , XII , A
5, ASHISH , XII , A

15.Consider the following dataframe :

df1

	mark1	mark2
0	10	15
1	40	45
2	15	30
3	40	70

Write the code to export this dataframe into the csv file Marks.csv.

DATA VISUALIZATION

MCQs

1. How do you set a title for a plot using matplotlib library?
   A. plt.set.title("Title")
   B. plt.Title("Title")
   C. plt.title("Title")
   D. plt.set_title("Title")
2. What is the function for creating a horizontal bar plot?
   A. plt.bar_hor(x, y)
   B. plt.hbar(x, y)
   C. plt.barh(x, y)
   D. plt.bar(x, y)
3. What is the standard way to import matplotlib's pyplot library in python
   A. import matplot as plt
   B. import matplotlib.pyplot as plt
   C. from matplotlib import pyplot as plt
   D. import matplotlib pyplot as plt
4. Given a Pandas series called p_series, the command which will display the last 4 rows is____.
   A. print(p_series.Tail(4))
   B. print (p_series.Tails(4))
   C. print (p_series.tail(4))
   D. print(p_series.Tails(4))
5. Using Python Matplotlib histograms can be used to count how many values fall into each interval. Each interval is known as
   A. hist
   B. class
   C. bin
   D. label

6. Which of the following type of chart is not valid-
    A. Line
    B. Pie
    C. Curve
    D. Bar
7. We can display more than one data series in –
    A. Line chart
    B. Bar chart
    C. Histogram
    D. Both A and B
    E. All of the above
8. In histogram it describes the no. of that fall within a given value of data range-
    A. bins
    B. bins
    C. range
    D. range()

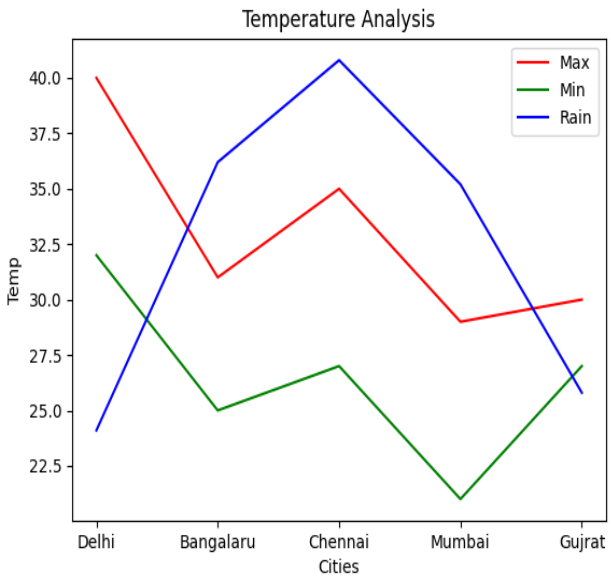
MLL Questions:

1. Pip install matplotlib is a command to install Matplotlib in your system.
2. In order to be able to use Python's Data Visualisation library, we need to import the pyplot module from Matplotlib library
3. mp.show() is used to display the figure, if matplotlib.pyplot as mp is imported.
4. Write the function name to draw line chart of two variables. plt.plot(x,y)
5. plt.savefig() function is used to save the plot.

Q1:

```
import pandas as pd
data={'city':['Delhi','Bangalaru','Chennai','Mumbai'],'MaxTemp':[40,31,35,29],'MinTemp':[32,25,27,
21],'Rainfall':[24.1,36.2,40.8,35.2]}
```

```
df=pd.DataFrame(data)
print(df)
df['difference']=df['MaxTemp']-
df['MinTemp']
#print(df)
df.loc[4]=['Gujrat',30,27,25.8,5]
##print(df)
#print(df.head(3))
df.to_csv('climate.csv')
#print(df.drop(1))
#print(df)
```

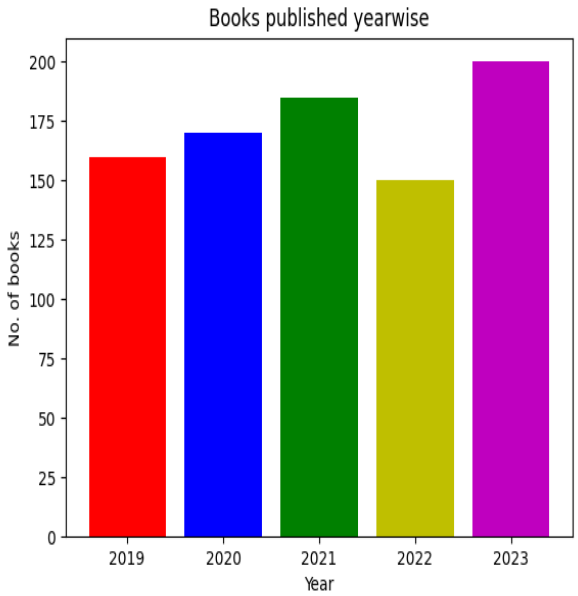



```
import matplotlib.pyplot as plt
plt.plot(df['city'],df['MaxTemp'],'r',label='Max')
plt.plot(df['city'],df['MinTemp'],'g',label='Min')
plt.plot(df['city'],df['Rainfall'],'b',label='Rain')
plt.legend()
plt.title('Temperature Analysis')
plt.xlabel('Cities')
plt.ylabel('Temp')
plt.show()
```

Q2:

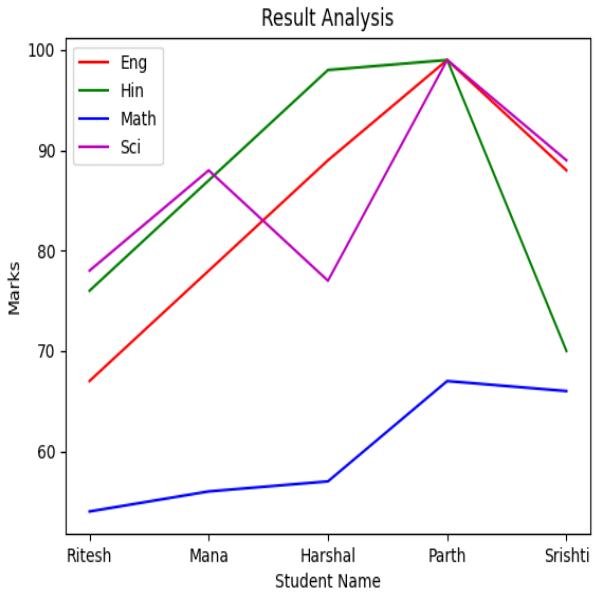
```
import pandas as pd
data={'BookID':['B001','B002','B003','B004'],'Subject':['CS','CS','CA','IP'],'BookTitle':['NCERT
CS','Move with IP','Sample papers','NCERT IP']}
df=pd.DataFrame(data)
print(df)
```

```
print(df.drop(3))
df.to_csv('Book.csv')
print(df.T)
print(df.head(3))

import matplotlib.pyplot as plt
nob=[160,170,185,150,200]
year=[2019,2020,2021,2022,2023]
plt.title('Books published yearwise')
plt.xlabel('Year')
plt.ylabel('No. of books')
plt.bar(year,nob,color=['r','b','g','y','m'])
plt.show()
```



Q3

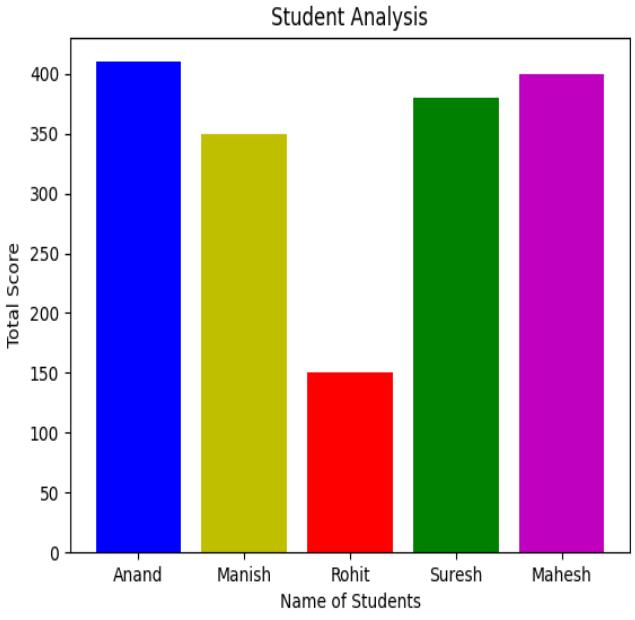
```
import pandas as pd
data={'Name':['Ritesh','Mana','Harshal','Parth','Srishti'],'English':[67,78,89,99,88],'Hindi':[76,87,98,99,70],'Maths':[54,56,57,67,66],'Science':[78,88,77,99,89]}
df=pd.DataFrame(data)
print(df)
df['Grade']=['A1','A2','A1','B1','A2']
print(df)
df.to_csv('studentinfo.csv')
print("No. of records",df.count())
print(df.T)

import matplotlib.pyplot as plt
```



```
plt.plot(df['Name'],df['English'],'r',label='Eng')
plt.plot(df['Name'],df['Hindi'],'g',label='Hin')
plt.plot(df['Name'],df['Maths'],'b',label='Math')
plt.plot(df['Name'],df['Science'],'m',label='Sci')
plt.legend()
plt.title('Result Analysis')
plt.xlabel('Student Name')
plt.ylabel('Marks')
plt.show()
```

Q4

```
import pandas as pd
data={'Name':['Anand','Manish','Rohit','Suresh','Mahesh'],'Year':[2020,2020,2021,2021,2020],'Total
Score':[410,350,150,380,400],'Result':['Pass','Pass','Fail','Pass','Pass']}
df=pd.DataFrame(data)
print(df)

print(df.loc[df['Name']=='Anand'])
print(df.loc[df['Result']=='Pass'])
df.to_csv('student.csv')
print(df['Year'])
print(df.shape)

import matplotlib.pyplot as plt
plt.bar(df['Name'],df['Total
Score'],color=['b','y','r','g','m'])
plt.title('Student Analysis')
plt.xlabel('Name of Students')
plt.ylabel('Total Score')

plt.show()
```



ASSERTION AND REASONING Based Questions:

Assertion (A) :

Data visualization refers to the graphical representation of information and data using visual elements like charts, graphs and maps etc.

Reason (R) :

To install matplotlib library we can use the command

pip install matplotlib.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

E. Both A and R are false

Assertion(A): Two sequences being plotted using plot function of matplotlib library do not produce any result and gives error.

Reasoning(R) : Two sequences being plotted do not match in their shape.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

E. Both A and R are false

Assertion : Line chart displayed as scatter chart.

Reasoning : linestyle argument is not specified with linecolor& markerstyle

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

E. Both A and R are false

Assertion : While plotting chart using matplotlib, the coordinate postion of x axis and y axis is always set to 0,0 and any data beyond this cannot be displayed

Reasoning : by using function pf pyplot we can limits for x-axis and y-axis.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

E. Both A and R are false

1. Consider a given Series , M1:

index

	Marks
Term1	45
Term2	65
Term3	24
Term4	89

Write a program in Python Pandas to create the series similar to creating a Dataframe.

2. Consider the Dataframe

Humanoid

H_1

H_2

H_3

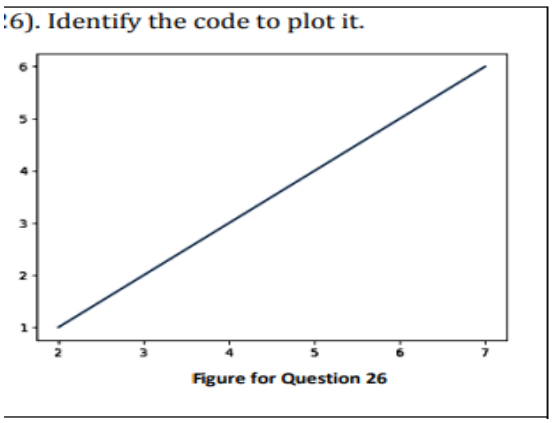
i. Write a command to display the records of the dataframe which have amount greater than equal to5000.

ii. How will you change the index from H_1,H_2,H_3 to101,102,103

SName	Amount
Alexa	7000
Cortana	5000
Siri	4000

CBT Questions

1. Consider the following graph (Figure 26). Identify the code to plot it.



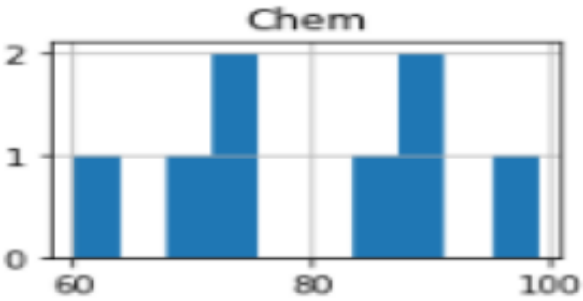
a. import matplotlib.pyplot as plt plt.plot ([2,7],[1,6])
plt.show( )

a. import matplotlib.pyplot as plt plt.plot([1,6],[2,7])
plt.show( )

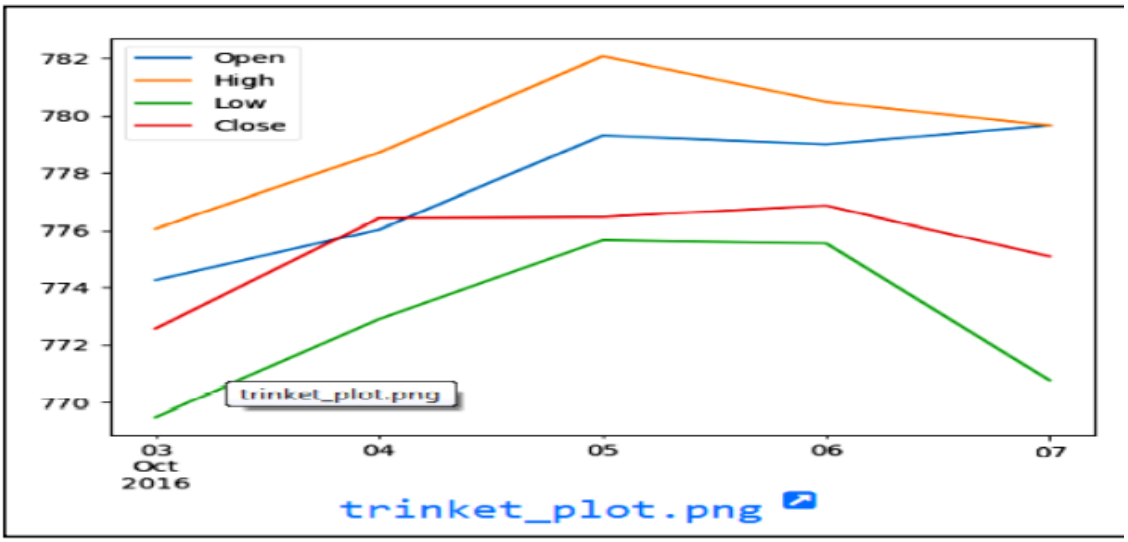
b. import matplotlib.pyplot as plt plt.plot([2,3],[5,1])
plt.show( )

d. import matplotlib.pyplot as plt plt.plot([1,3],[4,1])
plt.show( )

2. For the given histogram number of bins are



3. In the following line chart, the command to plot is



A. plt.plot(x,y,color='g',label='low')

```
plt.plot(x,y,color='r',label='close')
plt.plot(x,y,color='b',label='open')
plt.plot(x,y,color='y',label='high')
plt.legend()
```

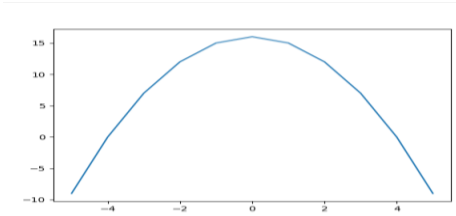
B.
```
plt.plot(x,y,colour='g',label='low')
plt.plot(x,y,colour='r',label='close')
plt.plot(x,y,colour='b',label='open')
plt.plot(x,y,colour='y',label='high')
plt.legend()
```

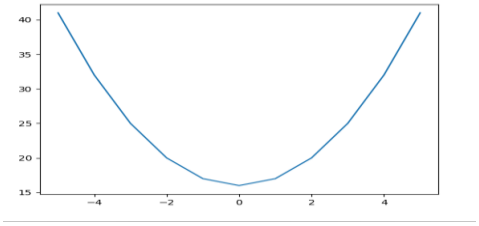
C.
```
plt.plot(x,y,linecolor='g',label='low')
plt.plot(x,y,linecolor='r',label='close')
plt.plot(x,y,linecolor='b',label='open')
plt.plot(x,y,linecolor='y',label='high')
plt.legend()
```

4. For the following code the line chart printed will be of which shape-

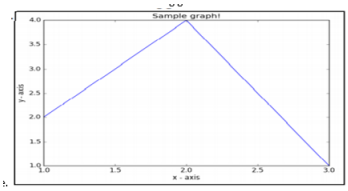
```
x=np.array([-5,-4,-3,-2,-1,0,1,2,3,4,5])
y=x**2+16
plt.plot(x,y)
plt.show()
```

A. B





C.



5. plt.legend() is not printing legend in the the graph, the reason could be-

   A. Label attribute is not set while plotting.

B. Legend is not plotted.

C. Legend color is not set.

D. Legend is not positioned properly.

6. While plotting multiple graph , the bars gets overlapped and some data is not shown, the way to print multiple bar is-

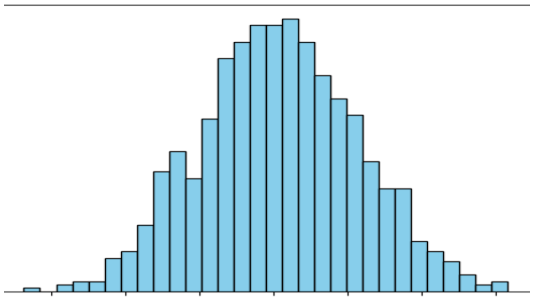
A. Setting thickness of bar

B. Setting starting position of bars on x axis for multiple data ranges.

C. Choosing different colors for different bars

D. Setting x label

7. What type of chart is this figure-



A. Multiple bar chart

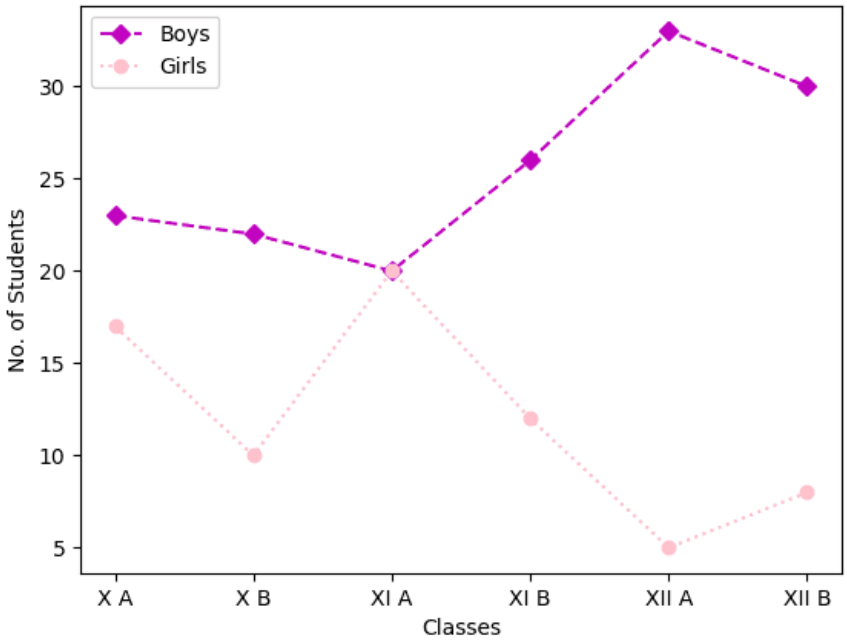
B. Bar chart

C. Histogram

D. Frequency polygon

CASE STUDY BASED Questions:

Q1. **Mrs. Namrata is a coordinator in the senior section school. She represented data on number of students who passed the exam on line chart as follows:**



She has written the following code but not getting the desired output. Help her by correcting her code.

```
import matplotlib.pyplot as plt

classes=["X A","X B","XI A","XI B","XII A","XII B"]

no_of_boys=[23,22,20,26,33,30]

no_of_girls=[17,10,20,12,5,8]

plt.line(classes,no_of_boys) #Statement 1

plt.line(classes,no_of_girls) #Statement 2

plt.xtitle("No of Stduents") #Statement 3

plt.ytitle("Classes") #Statement 4

plt.show()
```

i) What will be the correct code for Statement 1 and Statement 2?

ii) What is the correct function name for Statement 3 and Statement 4?

iii) Write a method and parameter required to display legends?

iv) Name the parameter and values used to apply the marker as given in the output.

v) Name the parameter and values used to apply line style as given in the output.

vi) How to apply the line colours as given in the figure?

vii) Write to save the figure as image.

Q1:

Consider the Data Frame below and answer the questions that follow.

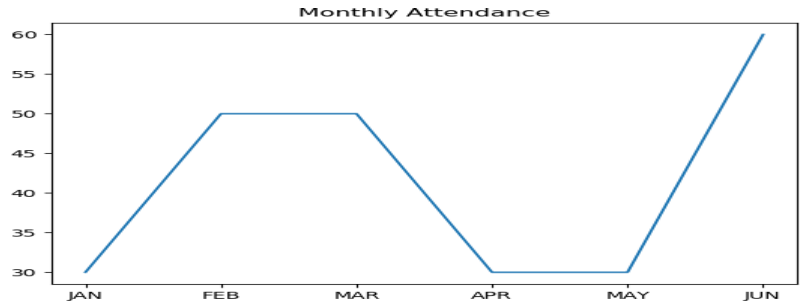
	Name	Weight	Height
A_1	Pawan	50	153
A_2	Piyush	60	165
A_3	Prem	40	150
A_4	Prakash	70	145
A_5	Prateek	55	160

a. Which command will produce the following output to extract only a part of dataframe?

Piyush	**60**
Prem	**40**
Prakash	**70**

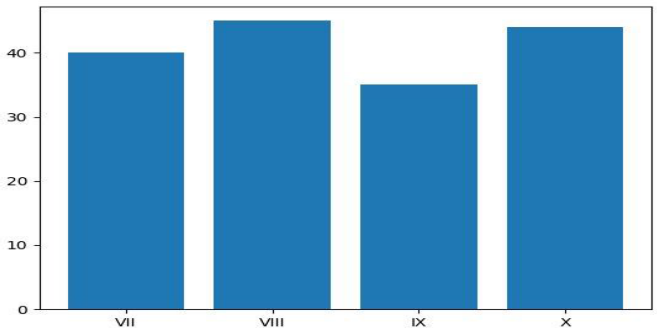
b. What is the correct syntax to display the record of Piyush? i. df_data[df_data['Name']='Piyush'] ii. df_data[df_data['Name']=='Piyush'] iii. df_data[df_data.Name=='Piyush'] iv. df_data['Name']=='Piyush'
c. What output of the command >>> df_data.max()
d. How do you display only the index of the dataframe df_data?
e. What is the shape of the dataframe df_data?

2. Write a code to plot the Monthly Attendance of students in class as shown in the figure given below: Display title of graph and name xlabel and ylabel. 3Marks

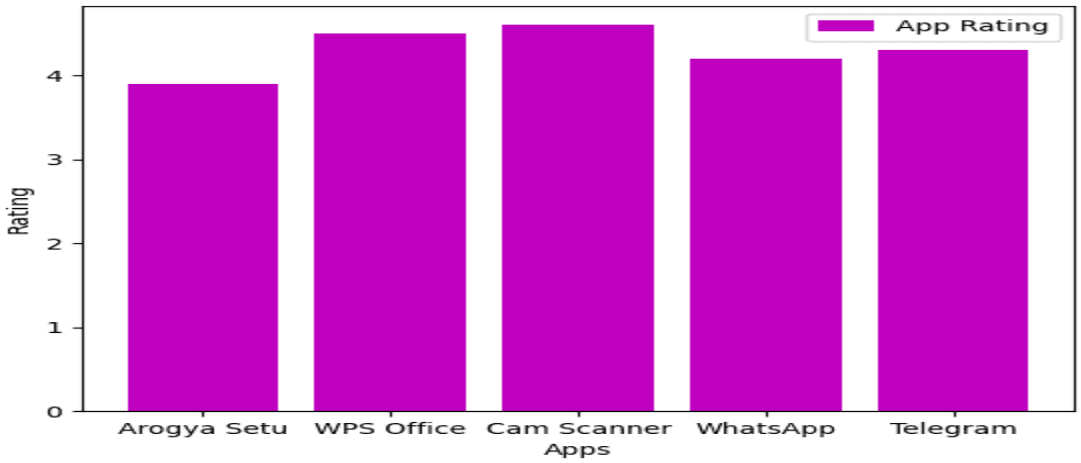


3.Draw a bar chart as below representing the number of students in each class.

Display title of graph and name xlabel and ylabel. Student Strength



4. **Mr. Vijay is working in the mobile app development industry and he was comparing the given chart on the basis of the rating of the various apps available on the play store.**



He is trying to write a code to plot the graph. Help Mr. Vijay to fill in the blanks of the code and get the desired output.

import _____ as plt #Statement 1

apps=["Arogya Setu","WPS Office","Cam Scanner","WhatsApp","Telegram"]

ps_rating=[3.9,4.5,4.6,4.2,4.3]

plt._____(apps,ps_rating,color='m',label=_____) #Statement 2 Statement 3

plt.xlabel("Apps")

plt._____("Rating") #Statement 4

plt._____ #Statement 5

plt._____ #Statement 6

i) Write the appropriate statement for #statement 1 to import the module.
ii) Write the function name and label name as displayed in the output for #statement 2 and #statement 3 respectively.
iii) Which word should be used for #statement 4?
iv) Write appropriate method names for #Statement 5 to display legends and #Statement 6 to open the figure.
v) Mr. Vijay wants to change the chart type to a line chart. Which statement should be updated and which method or function is used?

DATABASE CONCEPTS

MCQs

1. Which of the following queries contains an error ?
   (a) Select * from emp where empid=10003;
   (b) Select empid from emp where empid=10006;
   (c) Select empid from emp;
   (d) Select empid where empid=10009 and lastname= 'GUPTA';

2. A Table can have ____
   (a) Many primary keys and many unique keys.
   (b) One primary key and one unique key
   (c) One primary key and many unique keys.
   (d) Many primary keys and one unique key.

3. An attribute in a relation is termed as a foreign key when it reference the of another relation.
   (a) Foreign Key
   (b) Primary Key
   (c) Unique Key
   (d) Check Constraint

4. What should be the data type for the column Item_*Price* storing values less than Rs.1000
   e.g.230.21
   (a) VARCHAR(50)
   (b) NUMBER
   (c) DECIMAL(5,2)
   (d) NUMBER(6)

5. Identify the most correct INSERT queries from the following :
   (a) INSERT INTO Persons('xx1', 'yy1');
   (b) INSERT INTO Persons('Surname', 'Name')Values ('xxx', 'yyy');
   (c) INSERT INTO Persons Values('xx1' , 'yy1');
   (d) INSERT INTO Persons Value('xx1' , 'yyl')

6. To increase the size of a column in an existing table, use commond_.
   (a) Alter
   (b) Select
   (c) Modify
   (d) Modify Size

7. What is the meaning of **Remark LIKE "%7%7%";**
   (a) Column Remark begin with two 7s
   (b) Column Remark ends with two 7s
   (c) Column Remark has more than two 7s
   (d) Column Remark has two 7s in it, at any position.

8. Consider the following table namely Employee :

Employee_id	Name	Salary
1001	Rahul	6000
1009	Rohit	4500
1018	Ravi	7000

Which of the names will not be displayed by the below given query? ?

SELECT name from Employee WHERE employee_id>1009;

(a) Rahul, Rohit
(b) Rohit, Ravi
(c) Ravi
(d) Rahul, Ravi

9. Consider the following SQL Statement. What type of statement is this

INSERT INTO COACH VALUES (10211, 'RAHUL' , 'CS', 69000);

(a) Procedure
(b) DCL
(c) DML
(d) DDL

10. Which of the following will be the correct SQL command to add a new column FEES in a table TEACHER ?

(a) ALTER TABLE TEACHER ADD FEES FLOAT;
(b) ADD COLUMN FEES FLOAT INTO TEACHER;
(c) UPDATE TEACHER ADD COLUMN FEES FLOAT;
(d) INSERT INTO TEACHER ADD COLUMN FESS FLOAT;

11. Which of the following will display a list of tables in a database ?

(a) DISPLAY TABLES;
(b) SHOW TABLES;
(c) SELECT TABLES;
(d) VIEW TABLES;

12. Which of the following will display information about all the employees from employee table, whose names contains second letter as "A" ?

(a) SELECT * FROM EMPLOYEE WHERE NAME LIKE "_A%";
(b) SELECT * FROM EMPLOYEE WHERE NAME LIKE "%A_";
(c) SELECT * FROM EMPLOYEE WHERE NAME LIKE "_ _ A%";
(d) SELECT * FROM EMPLOYEE WHERE NAME = "_A%";

13. Which of the following SQL command will help in decremanting values of column in STUDENT table by 5% ?

(a) UPDATE STUDENT ASSIGN FEES = FEES * 1.5%;
(b) UPDATE STUDENT SET FEES = FEES- FEES * 1.05;
(c) UPDATE STUDENT SET FEES = FEES * 5%;
(d) UPDATE STUDENT SET FEES- 5%;

14. Which of the following clause is used with SELECT command in MySQL to avoid duplication of output rows.

(a) NO DUPLICATE
(b) UNIQUE

(c) DISTINCT
(d) NO REPEAT

15. Which SQL keyword is used to remove a table from a database?
    (a) DROP
    (b) DELETE
    (c) REMOVE
    (d) ALTER
16. To add a column named "Email" of type VARCHAR to an existing table named "Users," which SQL statement is correct?
    (a) ALTER TABLE Users ADD COLUMN Email VARCHAR
    (b) ALTER TABLE Users ADD Email VARCHAR
    (c) UPDATE TABLE Users ADD Email VARCHAR
    (d) INSERT INTO Users (Email) VALUES ('VARCHAR')

17. What is the correct SQL statement to create a foreign key in the "MYOrders" table that references the "Customers" table's primary key?
    (a) CREATE FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID);
    (b) ALTER TABLE MYOrders ADD CONSTRAINT fk_customer FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID);
    (c) ALTER TABLE MYOrders ADD FOREIGN KEY (CustomerID) REFERENCES Customers;
    (d) CREATE TABLE MYOrders ADD FOREIGN KEY CustomerID REFERENCES Customers;

18. What does the term 'cardinality' refer to in the context of databases?
    (a) The uniqueness of data in a column
    (b) The number of rows in a table
    (c) The number of tables in a database
    (d) The relationships between tables
19. What is the correct SQL syntax to return only distinct (different) values from the "Name" column in the "Employees" table?
    (a) SELECT DISTINCT Name FROM Employees;
    (b) SELECT UNIQUE Name FROM Employees;
    (c) SELECT DIFFERENT Name FROM Employees;
    (d) SELECT Name FROM Employees DISTINCT;
20. To update the "Salary" column in the "Employees" table by increasing all salaries by 10%, which SQL statement is correct?
    (a) UPDATE Employees SET Salary = Salary * 1.1
    (b) UPDATE Employees INCREASE Salary BY 10%
    (c) ALTER TABLE Employees MODIFY Salary = Salary * 1.1
    (d) CHANGE Employees SET Salary = Salary + (Salary * 0.1)

Answer:

1-d 2-c, 3-b, 4-c, 5-b, 6-a, 7-d, 8-c, 9-c ,10-a, 11-b, 12- a, 13- b, 14- c 15- a, 16-b, 17-b,,18-b, 19- a, 20-a

MLL Questions:

1. A large collection of related data, which models the relationship between various entities is called
   (a) Database
   (b) File
   (c) Record
   (d) None of these
2. Duplication of data is known as data
   (a) Redundancy
   (b) Inconsistency
   (c) Security
   (d) Dependency
3. A column in a table that uniquely identifies the rows in the table is called
   (a) Primary Key
   (b) Foreign Key
   (c) Candidate Key
   (d) Super Key
4. Which of the following is not DML Command
   (a) Select
   (b) Insert
   (c) Update
   (d) Create
5. Total Number of a column is called
   (a) Cardinality
   (b) Degree
   (c) Key
   (d) None of above
6. By using this command we can add a column in the existing table
   (a) Create
   (b) Insert
   (c) Drop
   (d) Alter
7. A is a property of the entire relation, which ensures through its value that each tuple is unique in a relation.
   (a) Rows
   (b) Key
   (c) Attributes
   (d) Fields
8. Special value that is stored when actual data value is unknown for an attributes.
   (a) Key
   (b) Null Value
   (c) Duplicate Value

(d) None

9. The operator which is used for pattern matching along with Select command
   (a) Between
   (b) In
   (c) Like
   (d) Case

10. Consider the table with structure as :
    Student(ID, name, dept_name, tot_cred)
    In the above table, which attribute will form the primary key?
   (a) name
   (b) dept_name
   (c) Total_credits
   (d) ID

11. Which of the following is a DDL command?
   (a) SELECT
   (b) CREATE
   (c) INSERT
   (d) UPDATE

12. Which operator can take wild card characters for query condition?

   (a) BETWEN
   (b) LIKE
   (c) IN
   (d) NOT

13. In SQL, which command(s) is/are used to change a table's structure/characteristics?
   (a) ALTER TABLE
   (b) MODIFY TABLE
   (c) CHANGE TABLE
   (d) All of these

14. Which of the following statements will delete all rows in a table namely

    m*ytable* without deleting the table's structure.
   (a) DELETE FROM mytable;'
   (b) DELETE TABLE mytable;
   (c) DROP TABLE mytable;
   (d) None of these.

15. What is the maximum value that can be stored in DECIMAL(5,2)?
   (a) 9999.99
   (b) 99.9999
   (c) 99.99
   (d) 9.99

Answer: 1-a,2-a,3-a,4-d,5-b,6-d,7-b,8-b,9-c,10-d,11-b,12-b,13-d, 14-a, 15-a

ASSERTION AND REASONING Based Questions:

Question No. 1 to 15 are ASSERTION and REASONING based questions. Mark the correct choice as
(a) Both A and R are true and R is the correct explanation for A
(b) Both A and R are true and R is not the correct explanation for A
(c) A is True but R is False
(d) A is False but R is True

1. Assertion(A): A database constraint can be added or removed any time from database tables.
   Reasoning(R): Alter table command is used to change the structure of table.
   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A
   (c) A is True but R is False
   (d) A is False but R is True
2. Assertion(A): SQL has efficient mechanisms to retrieve data stored in multiple tables in a MySQL database.
   Reasoning(R): The SQL statements CREATE is used to retrieve data from the tables in a database and is also called query statement.
   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A
   (c) A is True but R is False
   (d) A is False but R is True

3. Assertion (A): RDBMS stands for Relational Database Management System.
   Reasoning (R): RDBMS does not allow relating or associating two tables in a database.
   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A
   (c) A is True but R is False
   (d) A is False but R is True

1. Assertion (A): The number of attributes or columns in a relation is called the degree of the relation.
   Reasoning (R): The number of tuples or records in a relation is called the cardinality of the relation.
   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A
   (c) A is True but R is False

(d) A is False but R is True

2. Assertion (A): A foreign key is an attribute whose value is derived from the primary key of another relation.
   Reasoning (R): A foreign key is used to represent the relationship between tables or relations. (a)
   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A
   (c) A is True but R is False
   (d) A is False but R is True

6. Assertion (A): A database can have only one table.
   Reason (R): If a piece of data is stored in two places in the database, then storage space is wasted.
   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A
   (c) A is True but R is False
   (d) A is False but R is True

2. Assertion (A): Foreign key is a non-key attribute whose value is derived from primary key of another table.
   Reason (R): Each foreign key refers a candidate key in a relation.
   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A
   (c) A is True but R is False
   (d) A is False but R is True
3. Assertion (A): Select command is DML Command
   Reason (R): Update is also a DML Command to update the table
   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A
   (c) A is True but R is False
   (d) A is False but R is True

4. Assertion (A): CHAR and VARCHAR2 is used for character datatype
   Reason (R): VARCHAR2 is used for variable length character strings whereas CHAR is used for fixed length strings
   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A (b)
   (c) A is True but R is False
   (d) A is False but R is True
5. Assertion (A): It is possible to remove the tuple from the table.

Reason (R): DROP command is used to delete the tuple.

(a) Both A and R are true and R is the correct explanation for A

(b) Both A and R are true and R is not the correct explanation for A (b)

(c) A is True but R is False ©

(d) A is False but R is True

6. Assertion (A): Update Command is used to modify the constraints
   Reason (R): Alter Command is used to add the constraints.

   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A **(b)**
   (c) A is True but R is False
   (d) A is False but R is True
7. Assertion (A): Where clause can also be included with Select Command
   Reason (R): Where clause is used to filter the data based on given condition.

   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A (b)
   (c) A is True but R is False
   (d) A is False but R is True
8. Assertion (A): Primary key and Alternate Keys are subset of Candidate Keys
   Reason (R): Primary Key should be unique and not null.
   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A (b)
   (c) A is True but R is False
   (d) A is False but R is True

9. Assertion (A): Candidate key can be any attribute or combination of attributes that can qualify as unique key in the database
   Reason (R): There can be multiple candidate keys in a table.
   (a) Both A and R are true and R is the correct explanation for A
   (b) Both A and R are true and R is not the correct explanation for A (b)
   (c) A is True but R is False
   (d) A is False but R is True
10. Assertion (A): Data redundancy is the duplicate data exist in database.
    Reason (R): Data Consistency improves by controlling Data Redundancy.
    (a) Both A and R are true and R is the correct explanation for A
    (b) Both A and R are true and R is not the correct explanation for A (b)
    (c) A is True but R is False
    (d) A is False but R is True

Answers 1. B 2. C 3. C 4. B 5. A 6. D 7. B 8. B 9 B 10 C 11D 12 B 13 B 14 B 15 A

CASE STUDY BASED Questions:

Consider the Table ACCOUNT and solve the question from 1 to 15

TABLE: ACCOUNT

ANO	ANAME	ADDRESS	AMOUNT
101	Nirja Singh	Bangalore	15000
102	Rohan Gupta	Chennai	20000
103	Ali Reza	Hyderabad	50000
104	Rishabh Jain	Chennai	56000
105	Simran Kaur	Chandigarh	25000

1. List the Account number and account holder name who are not living in Chennai.
2. Display the Account number who are belongs to Hederabad Address.
3. Display the Account holder names whose name is begin with letter R.
4. Increase the Amount number by 5000.
5. Display ANAME where ANO ranges from 101 to 105
6. Insert the values in above table with 106,'Ram Singh' Mumbai 10000.
7. Remove all the records whose ADDRESS is Chennai but not ANO 104.
8. Display the Account holder's Names,Amount having amount is less than 1000 or address is chandigrah.
9. Write the Degree and Cardinality of the table Account.
10. Add the column company of Character type.
11. Add the ANO as Primary Key constraint.
12. Delete all the records whose Amount is less than 50000.
13. List all those records whose AMOUNT is more than 20000 and less than 50000.
    Give the output of following sql statement based on table ACCOUNT
14. Select distinct(Address) from ACCOUNT where ACNO in (101,103)
15. Increase the value of amount of all account holders who are from Chennai.

Answers :

1. Select ANO,ANAME from ACCOUNT where ADDRESS not in ("Chennai");
2. Select ANO from ACCOUNT where ADDRESS in ("Hyderabad");
3. Select ANAME from ACCOUNT where ANAME like "R%";
4. Update ACCOUNT set AMOUNT=AMOUNT+5000;
5. Select ANAME FROM ACCOUNT where ANO between 101 and 105;
6. Insert into ACCOUNT values(106,'Ram Singh','Mumbai'.10000)
7. Delete from ACCOUNT Where ADDRESS='Chennai' and ANO<>104;
8. Select ANAME,AMOUNT from ACCOUNT where AMOUNT<1000 OR ADDRESS='Chandigarh';
9. Degree= 4, Cardinality= 5
10. ALTER table ACCOUNT add Company varchar2(10);
11. Alter table Account add primary key (ANO);
12. Delete from ACCOUNT where AMOUNT<50000;
13. Select * From ACCOUNT Where AMOUNT>20000 AND AMOUNT<50000.
14. Chennai
15. UPDATE ACCOUNT set AMOUNT=AMOUNT+0.5*AMOUNT where ADDRESS='Chennai';

MySQL Math and Text Functions

MCQs

1. A function working with every row of a table is a ___ function.
   a. Aggregate b. Single value
   c. Single row d. summary
2. Which of the following is not a text function?
   a. TRIM() b. TRUNCATE()
   c. LEFT() d. MID()
3. Which of the following is not a numeric function?
   a. MOD b. SIGN
   c. MID d. POW
4. Which of the following is not a date function?
   a. Month b. Year
   c. NOW d. POW
5. Which of the following function returns the substring from a given string?
   a. MID b. INSTR
   c. SUBSTR d. CHAR
6. Which of the following functions return the position of a substring from a given string?
   a. MID b. INSTR
   c. SUBSTR d. CHAR
7. Which one of the following is not an aggregate function?
   a. ROUND() b. SUM()
   c. COUNT() d. AVG()
8. Which of the following SQL functions does not belong to the Math functions category?
   a. POWER() b. ROUND()
   c. LENGTH() d. MOD()
9. Which of the following is not a valid aggregate function in MYSQL?
   a. COUNT() b. SUM()
   c. MAX() d. LEN()
10. What will be printed by the given query?

SELECT LENGTH ("WINNER");

a. 7 b. 6
c. 8 d. 9

11. what will be printed by the given query?

SELECT INSTR ("INDIA", "DI");

a. 7 b. 3
c. -2 d. -3

12. If the substring is not present in a string, the INSTR ( ) returns :

a. -1 b. 1

c. NULL d. 0

13. what will be returned by the given query?

SELECT CONCAT ("IT", "WAS", "OK');

a. "It was ok" b. "It wasok"

c. "Itwasok" d. "It was ok"

14. predict the output of the following query?

SELECT LCASE (MONTHNAME ('2023-03-05'));

a. May b. March

c. may d. march

15. To remove the leading and trailing in MySQL Table, we use

a. Left () b. Right ()

c. Trim () d. Ltrim ()

16. what will be returned by the given query?

SELECT ROUND (153.669, 2);

a. 153.6 b. 153.66

c. 153.67 d. 153.7

17. what will be returned by the given query?

SELECT Sing (26);

a. 1 b. -1

c. 0 d. none of these

18. what will returned by the given query?

SELECT Truncate (15.79, -1), Truncate (15.79,0), Truncate (15.79,1);

a. 15 15 15.7 b. 10 15.7 15.9

c. 10 15 15.7 d. 10 10 15.9

19. what will be returned by the given query?

SELECT month ('2020-05-11');

a. 5 b. 11

c. May d. November

20. which of the following are not correct aggregate functions in SQL ?

a. AVERAGE () b. MAX ()

c. COUNT () d. TOTAL ()

Answers:

1	c	2	b	3	c	4	d	5	C,a
6	b	7	a	8	c	9	d	10	b
11	b	12	d	13	c	14	b	15	c
16	c	17	a	18	c	19	a	20	d

MLL Questions:

Predict the output of following queries :
(j) SELECT 9 mod 2;
(ii) SELECT CONCAT('CatCh', 'a', 'falling', 'star');
(iii) SELECT ROUND(7658.345, 2);
(iv) SELECT MOĐ(ROUND (13,9,0), 3);
(y) SELECT TRIM("ALLTHE BEST");
(vi) SELECT POWER(5, 2);
(vii) SELECT UPPER(MID("St&'t up india", le));
(viii) SELECT SUBSTR("FIT INDIA MOVEMENT", 5);
(ix) SELECT INSTR("ARTIFICIAL INTELLIGENCE", "IA");
(x) SELECT POW(2,3);
(xi) SELECT ROUND(123.2345, 2),ROUND(342.9234, -1);
(xii) SELECT LENGTH("Informatics Practices");
(xiii) SELECT YEAR("1979/11/26"), MONTH("1979/11/26"), DAY("1979/11/26"),MONTHNAME("1979/11/26");
(xiv)SELECT LEFT("INDIA",3), RIGHT("Computer Science", 4);
(xv)SELECT MID("InformaticS", 3, 4), SUBSTR("Practices", 3);

CASE STUDY BASED Questions:

Consider a table SALESMAN with the following BONUS DATE OF JOIN
Write SQL queries using SQL functions to perform the following operations:

SNO	SNAME	SALARY	BONUS	DATE OF JOIN
A01	Beena Mehta	30000	45.23	2019-10-29
A02	K.L.sahay	50000	25.34	2018-3-13
B03	Nisha Thakur	30000	35.00	2017-3-18
B04	Leela Yadav	80000	NULL	2018-12-31
C05	Gautam Gola	20000	NULL	1989-01-23
C06	Trapti Garg	70000	12.37	1987-6-15
D07	Neena Sharma	50000	27.89	1999-3-18

(a) Display salesman name and bonus after rounding off to zero decimal places.
(b) Display the position of occurrence of the string “ta” in salesman names.
(c) Display the four cha racters from salesrnaJl naine starting from second character.
(d) Display the month naine for the date of joifl of salesman
(e) Display the name of the weekday for flic date of join of salesman.
Solution.

MySQL Date and Aggregate Functions

MCQs

1. Which function returns the current date and time?
    - a) DATE()
    - b) NOW() (**Correct Answer**)
    - c) YEAR()
    - d) DAY()
2. What function extracts the month number (1-12) from a date value?
    - a) MONTHNAME()
    - b) DAYNAME()
    - c) MONTH() (**Correct Answer**)
    - d) YEAR()
3. Which function retrieves the full month name (e.g., 'January')?
    - a) MONTH()
    - b) YEAR()
    - c) DAY()
    - d) MONTHNAME() (**Correct Answer**)
4. What function returns the year as a four-digit number?
    - a) DAY()
    - b) YEAR() (**Correct Answer**)
    - c) MONTHNAME()
    - d) NOW()
5. Which function extracts the day of the month as a number (1-31)?
    - a) DAYNAME()
    - b) DAY() (**Correct Answer**)
    - c) MONTH()
    - d) YEAR()
6. What function retrieves the full weekday name (e.g., 'Monday')?
    - a) MONTH()
    - b) DAY()
    - c) DAYNAME() (**Correct Answer**)
    - d) YEAR()

7. Which aggregate function returns the highest value in a column?
    - a) AVG()
    - b) MIN()
    - c) MAX() (**Correct Answer**)
    - d) SUM()
8. What aggregate function calculates the average of a numeric column?
    - a) SUM()
    - b) COUNT()
    - c) AVG() (**Correct Answer**)
    - d) MIN()
9. Which aggregate function computes the total sum of a numeric column?
    - a) MIN()
    - b) MAX()
    - c) COUNT()
    - d) SUM() (**Correct Answer**)
10. What aggregate function determines the number of rows (including NULL values)?
    - a) AVG()
    - b) SUM()
    - c) COUNT() (**Correct Answer**) (can use COUNT(*))
    - d) MAX()
11. The GROUP BY clause is used to:
    - a) Sort data in ascending or descending order
    - b) Filter rows based on specific criteria
    - c) Group rows with matching values in one or more columns (**Correct Answer**)
    - d) Combine results from multiple tables
12. The HAVING clause is used with GROUP BY to:
    - a) Apply additional filtering conditions after grouping (**Correct Answer**)
    - b) Define the order in which results are retrieved
    - c) Specify columns to be included in the result set
    - d) Rename columns in the output
13. The ORDER BY clause is used to:
    - a) Group rows based on shared values
    - b) Filter rows based on specific criteria
    - c) Sort data in ascending or descending order (**Correct Answer**)
    - d) Combine results from multiple tables
14. Which of the following is NOT a valid order in the ORDER BY clause?
    - a) column_name ASC
    - b) column_name DESC
    - c) column_name
    - d) column_name + 5 (**Correct Answer**) - Order by expressions are not allowed

15. How can you count the number of employees in each department using GROUP BY?
    - a) SELECT COUNT(*) FROM employees GROUP BY department; (**Correct Answer**)
    - b) SELECT COUNT(department) FROM employees;
    - c) SELECT department, COUNT(*) FROM employees;
    - d) SELECT * FROM employees GROUP BY department;

16. Write a query to find the average salary for each department:

    a) SELECT Department, AVG(Salary) FROM Employees; (**Correct Answer**)
    b) SELECT Department, SUM(Salary) FROM Employees;
    c) SELECT * FROM Employees WHERE Salary > AVG(Salary);
    d) None of the above

17. What is the output of the following query: SELECT YEAR(CURDATE()); (Assuming today's date is 2024-05-13)

    a) 2024 **(Correct Answer)**
    b) 12
    c) Friday
    d) An error

18. How can you find the number of employees in a department with a salary greater than 50000?

a) SELECT COUNT(*) FROM employees WHERE department = 'IT' AND salary > 50000;
b) SELECT SUM(salary) FROM employees WHERE department = 'IT' AND salary > 50000;
c) SELECT MAX(salary) FROM employees WHERE department = 'IT' AND salary > 50000;
d) SELECT AVG(salary) FROM employees WHERE department = 'IT' AND salary > 50000;

Ans: a) SELECT COUNT(*) FROM employees WHERE department = 'IT' AND salary > 50000;

19. Which function returns the number of distinct values in a column?
a) COUNT(DISTINCT column_name)
b) COUNTALL(column_name)pen_spark
c) DISTINCTCOUNT(column_name)
d) None of the above
Answer: a) COUNT(DISTINCT column_name))

20. Write a query to find the month with the highest number of sales (assuming a sales table with sale_date column).

(a) SELECT MONTH(sale_date), COUNT(*) FROM sales GROUP BY MONTH(sale_date) ORDER BY COUNT(*) DESC LIMIT 1; **(Correct Answer)**

(b) SELECT MAX(COUNT(*)) FROM sales GROUP BY MONTH(sale_date);
(c) SELECT MONTHNAME(sale_date), COUNT(*) FROM sales;
(d) SELECT * FROM sales ORDER BY MONTH(sale_date) DESC;

MLL Questions:

Date Functions

1. Write a query to display the current date and time.
2. Write a query to display the date part only from a DATETIME column named 'order_date'.
3. Write a query to display the month number (1-12) from a DATETIME column named 'hire_date'.
4. Write a query to display the full month name (e.g., 'January') from a DATETIME column named 'birth_date'.
5. Write a query to display the year from a DATETIME column named 'registration_date'.

Answers:

1. SELECT NOW();
2. SELECT DATE(order_date) FROM your_table;
3. SELECT MONTH(hire_date) FROM your_table;
4. SELECT MONTHNAME(birth_date) FROM your_table;
5. SELECT YEAR(registration_date) FROM your_table;

Aggregate Functions

6. Write a query to find the maximum value in a numeric column named 'salary'.
7. Write a query to find the minimum value in a numeric column named 'age'.
8. Write a query to calculate the average value in a numeric column named 'price'.
9. Write a query to calculate the total sum of a numeric column named 'quantity'.
10. Write a query to count the number of rows in a table named 'customers'.

Answers:

6. SELECT MAX(salary) FROM your_table;
7. SELECT MIN(age) FROM your_table;
8. SELECT AVG(price) FROM your_table;
9. SELECT SUM(quantity) FROM your_table;
10. SELECT COUNT(*) FROM customers;

Querying and Manipulating Data

11. Write a query to display the number of orders placed in each month (grouped by month).

12. Write a query to display the total number of orders with an order amount greater than Rs. 1000 (use HAVING clause).
13. Write a query to display the product names and their average price, ordered by price in descending order.
14. Write a query to calculate the average age of employees in the 'employees' table (assuming the table has a 'dob' column).
15. Write a query to select the top 10 highest-earning employees (based on salary) from a table named 'employees'.

Answers:

11. SELECT MONTHNAME(order_date), COUNT(*) AS order_count FROM orders GROUP BY MONTH(order_date);
12. SELECT COUNT(*) AS order_count FROM orders HAVING order_amount > 1000;
13. SELECT product_name, AVG(price) AS average_price FROM products GROUP BY product_name ORDER BY average_price DESC;
14. SELECT AVG(YEAR(CURDATE()) - YEAR(dob)) AS average_age FROM employees;
15. SELECT * FROM employees ORDER BY salary DESC LIMIT 10;

ASSERTION AND REASONING Based Questions:

Instructions: Solve the following Assertion (A) and Reasoning (R) questions. Choose the most appropriate option.

(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.

1. Assertion (A): The DATE() function in MySQL returns the current date and time.

Reasoning (R): The NOW() function is used to retrieve the current date and time.

Answer: (b) Both A and R are true, but R is not the correct explanation of A.

Explanation: The DATE() function extracts the date part from a datetime or timestamp value. The NOW() function returns the current date and time including timestamp.

2. Assertion (A): The MONTHNAME() function returns the abbreviated month name (e.g., 'Jan' for January).

Reasoning (R): The MONTH() function returns the numeric value of the month (1 for January).

Answer: (a) Both A and R are true, and R is the correct explanation of A.

3. Assertion (A): The YEAR() function can be used to filter data for a specific year.

Reasoning (R): The result of the YEAR() function can be used in a WHERE clause.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

4. Assertion (A): The DAYNAME() function returns the weekday name (e.g., 'Sunday').

Reasoning (R): The DAY() function returns the numeric value of the day within the week (1 for Sunday).

Answer: (a) Both A and R are true, and R is the correct explanation of A.

5. Assertion (A): The MAX() function returns the highest value in a column.

Reasoning (R): Aggregate functions operate on entire columns or groups of rows.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

6. Assertion (A): The MIN() function can be used to find the minimum salary in an employee table.
Reasoning (R): The MIN() function works with numeric data types.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

7. Assertion (A): The AVG() function calculates the average of a column's values.

Reasoning (R): Aggregate functions are used for summarized data calculations.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

8. Assertion (A): The SUM() function adds all the values in a selected column.

Reasoning (R): The SUM() function can be used for various data types like integers and decimals.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

9. Assertion (A): The COUNT(*) function returns the total number of rows in a table.

Reasoning (R): The asterisk (*) wildcard symbol represents all columns in the table.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

1 Assertion (A): The GROUP BY clause is used to categorize data before applying aggregate functions.
Reasoning (R): The HAVING clause filters grouped data based on aggregate function results.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

11. Assertion (A): The ORDER BY clause sorts the results of a query in ascending or descending order. **Reasoning (R):** The ORDER BY clause can be used with multiple columns for sorting.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

12. Assertion (A): You can use aggregate functions with the SELECT clause to retrieve summarized data. **Reasoning (R):** Aggregate functions perform calculations on entire columns or groups of rows.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

13. Assertion (A): The HAVING clause is used after the GROUP BY clause to filter grouped data. **Reasoning (R):** The HAVING clause uses conditions based on aggregate function results.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

14. Assertion (A): The GROUP BY clause is used to group rows based on one or more columns.

Reason (R): The HAVING clause is used to filter grouped data based on aggregate function results.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

15. Assertion (A): The COUNT() function returns the total number of rows in a table.

Reasoning (R): The COUNT(*) function specifically counts the number of rows, even if some columns are null.

Answer: (b) Both A and R are true, but R is the correct explanation of A.

CASE STUDY BASED Questions:

Sr. No. -1 Case Base Study -

Answer all the following questions based on the table customers with the following schema:

CREATE TABLE customers (customer_id INT PRIMARY KEY, name VARCHAR(50), email VARCHAR(100), registration_date DATE);

Scenario: This table stores information about customers, including their ID, name, email address, and registration date.

Date Functions:

1. Write a query to display the current date and time.
2. Write a query to extract the year, month, and day from a customer's registration date (e.g., for customer ID 1).

3. Write a query to display the month name for all customer registrations.
4. Write a query to find the day of the week on which a customer registered (e.g., for customer ID 1).

Aggregate Functions:

5. Write a query to find the total number of customers registered. (Use COUNT(*))
6. Write a query to find the customer ID with the earliest registration date. (Use MIN(registration_date))
7. Write a query to find the average number of days a customer has been registered (consider today's date).
8. Write a query to find the total number of customers registered in each month (use MONTH(registration_date))

Data Manipulation:

9. Write a query to display the names of customers registered in the last 30 days. 1 (Hint: Use CURDATE() and DATE_SUB(CURDATE(), INTERVAL 30 DAY))
10. Write a query to display the customer details (ID, name, email) grouped by month of registration.

HOTS:

11. Write a query to find the customer with the most recent registration.
12. Write a query to display the number of customers registered on each day of the week. (Use DAYNAME(registration_date))
13. Write a query to find the months with more than 10 customer registrations. (Use HAVING)
14. Write a query to display the customer details sorted by registration date (ascending).
15. Write a query to display the customer details sorted by registration date (descending) and then by name (ascending).

Answers:

(Replace customer_id with the actual ID for specific customer queries)

1. SELECT NOW();
2. SELECT YEAR(registration_date), MONTH(registration_date), DAY(registration_date) FROM customers WHERE customer_id = customer_id;
3. SELECT MONTHNAME(registration_date) AS month_name FROM customers;
4. SELECT DAYNAME(registration_date) AS day_of_week FROM customers WHERE customer_id = customer_id;
5. SELECT COUNT(*) AS total_customers FROM customers;

6. SELECT customer_id FROM customers WHERE registration_date = (SELECT MIN(registration_date) FROM customers);
7. SELECT AVG(DATEDIFF(CURDATE(), registration_date)) AS avg_registration_days FROM customers;
8. SELECT MONTH(registration_date) AS month, COUNT(*) AS customer_count FROM customers GROUP BY MONTH(registration_date);
9. SELECT name FROM customers WHERE registration_date >= DATE_SUB(CURDATE(), INTERVAL 30 DAY);
10. SELECT MONTHNAME(registration_date) AS month, name, email FROM customers GROUP BY MONTH(registration_date);

HOTS Answers:

11. SELECT * FROM customers WHERE registration_date = (SELECT MAX(registration_date) FROM customers);
12. SELECT DAYNAME(registration_date) AS day, COUNT(*) AS customer_count FROM customers GROUP BY DAYNAME(registration_date);
13. SELECT MONTHNAME(registration_date) AS month, COUNT(*) AS customer_count FROM customers GROUP BY MONTH(registration_date) HAVING COUNT(*) > 10;
14. SELECT * FROM customers ORDER BY registration_date ASC;
15. SELECT * FROM customers ORDER BY registration_date DESC, name ASC;

Sr. No. -2 Case Base Study -

Write commands in SQL for (i) to (iii) and output for (iv) and (v)

StoreId	Name	Location	City	NoOfEmp	DateOpen	SalesAmt
S101	Planet Fashion	Bendra	Mumbai	7	2015-10-16	40000
S102	Vogue	Karol Bagh	Delhi	8	2015-07-14	120000
S103	Trends	Powai	Mumbai	10	2015-06-24	30000
S104	Super Fashion	Thane	Mumbai	11	2015-02-06	45000
S105	Annabelle	South Extn.	Delhi	8	2015-04-09	60000
S106	Rage	Defence Colony	Delhi	5	2015-03-01	20000

(i) To display names of stores along with Sales Amount of those stores that are located in Mumbai.
(ii) To display the details of store in alphabetical order of name.
(iii) To display the City and the number of stores located in that City, only if number of stores is more than 2.
(iv) SELECT MIN(DateOpen) FROM Store;
(v) SELECT COUNT(StoreId), NoOfEmp FROM Store GROUP BY NoOfEmp HAVING MAX(SalesAmt)<60000;

Ans. (i) SELECT Name,SalesAmt FROM Store WHERE City='Mumbai';
(ii) SELECT * FROM Store ORDER BY Name;
(iii) SELECT City, COUNT(*) FROM Store GROUP BY Store HAVING COUNT(*)>2;
(iv)

Min(DateOpen)
2015-02-06

(v)

Count(Storeid)	NoOfEmp
1	10
1	11
1	5
1	7

Sr. No. -3 Case Base Study -

Consider the following tables ACTIVITY and COACH and Write SQL commands for the statements (i) to (iv) and give the outputs for the SQL queries (v) to (viii)
Table - ACTIVITY

ACode	ActivityName	ParticipantsNum	PrizeMoney	ScheduleDate
1001	Relay 100X4	16	10000	23-Jan-2004
1002	High Jump	10	12000	12-Dec-2003
1003	Shot Put	12	8000	14-Feb-2004
1005	Long Jump	12	9000	01-Jan-2004
1008	Discuss Throw	10	15000	19-Mar-2004

Table: COACH

PCode	Name	ACode
1	Ahmed Hussain	1001
2	Ranvinder	1008
3	Janila	1001
4	Naaz	1003

(i) To display the name of all activities with their Acodes in descending order.
Ans. SELECT ActivityName, Acode FROM activity ORDER BY Acode DESC;

(ii) To display sum of prizemoney for each of the number of participants groupings (as shown in column ParticipantsNum 10,12,16)
Ans.: SELECT SUM(PrizeMoney), ParticipantsNum FROM activity GROUP BY ParticipantsNum;

(iii) To display the coach's name and ACodes in acending order of ACode from the table COACH.
Ans: SELECT Name,ACode FROM coach ORDER BY ACode;

(iv) To display the content of the Activity table whose ScheduleDate is earlier than 01/01/2004 in ascending order of ParticipantsNum
Ans: SELECT * FROM activity WHERE ScheduleDate<{01/01/2004} ORDER BY ParticipantsNum;

(v) SELECT COUNT(DISTINCT ParticipantsNum) FROM Activity;

Ans – 3

Points To Remember :

Date functions like NOW() return the current date and time, while DATE() extracts just the date part.
MONTH() gives the numeric month (1-12), MONTHNAME() spells it out (January).
YEAR() isolates the year, and DAY() and DAYNAME() handle day of month and its name.
Aggregate functions summarize data.
MAX() finds the highest value, MIN() the lowest, and AVG() calculates the average.
SUM() adds all values in a column, and COUNT() tells you how many rows exist.
COUNT(*) counts all rows, regardless of NULL values.
GROUP BY: Groups rows based on shared values in one or more columns
HAVING: Filters grouped data based on a condition applied to aggregate results.
ORDER BY sorts data based on a chosen column, ascending or descending.

Unit-3 Introduction To Computer Networks

INTRODUCTION OF NETWORKS

MCQs

1. What is a stand-alone computer?
   a) a computer that is not connected to a network
   b) a computer that is being used as a server
   c) a computer that does not have any peripherals attached to it
   d) a computer that is used by only one person
   Ans: a) a computer that is not connected to a network
2. Hub is a:
   a) Broadcast device b) Unicast device
   c) Multicast device d) None of these
   Ans.: a) Broadcast device
3. The device that can operate in place of a hub is a :
   a) Switch b) Bridge c) Router d) Gateway
   Ans: a) Switch
4. A repeater takes a weak and corrupted signal and _____ it.
   a) Amplifies b) Regenerates c) Resembles d) Reroutes
   Ans: b) Regenerates
5. Component that is required to connect the computer to a network is:
   a) Network Interface Card b) Hub c) Switch d) Wireless Access Point
   Ans: a) Network Interface Card
6. A _____ is a networking device that filters network data.
   a) Switch b) Gateway c) Router d) Modem
   Ans: a) Switch
7. A computer in a network that cannot be accessed outside of the local network without giving proper permission is called _____
   a) Intranet b) Middleware c) Internet d) Modern
   Ans: a) Intranet
8. A _____ device is used to connect multiple nodes in a network.
   a) Hub b) Repeater c) Router d) Modem
   Ans: a) Hub
9. _____ is a device which seeks information on a network from server.
   a) Client b) Networking c) Workstation d) All of these
   Ans: a) Client
10. Which one of the following network devices is the routing device?
    a) Hub b) Router c) Both d) None

Ans: b) Router

11. Which one of the following network devices is used to connect different networks?
    a) Hub b) Router c) Switch d) None
    Ans: b) Router
12. Which one of the following network devices not provides security measures to protect the network?
    a) Hub b) Router c) Gateway d) Bridge
    Ans: b) Hub
13. Which one of the following network devices is the broadcast device?
    a) Hub b) Repeater c) Router d) Modem
    Ans: a) Hub
14. Which one of the following network devices is used to create a network?
    a) Hub b) Repeater c) Router d) Switch
    Ans: d) Switch
15. Which one of the following network devices can work with similar networks?
    a) Repeater b) Router c) Gateway d) All
    Ans: b) Router
16. A network allows to
    a) Resource sharing b) File Sharing c) Fast communication d) All
    Ans: d) All
17. In a network, receiver end in known as _____
    a) Client b) Server c) Workstation d) All of these
    Ans: a) Client
18. Select odd one:
    a) Client b) Server c) Communication Medium d) None
    Ans: d) None
19. A Gateway can be implemented as:
    a) Hardware b) Software c) Both a and b d) None
    Ans: c) Both a and b
20. A passive hub
    a) Broadcast signal b) Amplifies Signal c) Amplifies and broadcast d) All
    Ans: c) Amplifies and broadcast

MLL Questions:

1. Expand the following: a) APRANET b) ISP
   Ans. a) Advanced Research Projects Agency Network
   b) Internet Service Provider
2. Write one advantage and one disadvantage of network?
   Ans. *Advantages*:
   1. Sharing of resources.

2. Data protection.

3. Improved speed of communication.

Disadvantages:

Security concerns, server dependence, high setup costs, maintenance needs.

3. What is server and client?

   Ans. Server is a computer or repository which facilitates networking tasks such as sharing of files, resources and communicating among hosts (clients) in a network.

   Client is a node or workstation that requests for a service from a server. It is just like a consumer in that network.

4. Define Communication channel?

   Ans. Communication channel is a medium by which hosts in a network interact with each other hosts and server(s).

5. Write different types of Communication channels?

   Ans: **Wired**: When host(s) and server(s) are connected with one another through **guided media**. Such as: co-axial cables, twisted paired cables, fibre optic cables.

   Wireless: When host(s) and server(s) are connected with one another through **unguided media**. Such as: radio wave, micro wave, satellites, infrared, Bluetooth, laser etc.

6. How a protocol is important in communication?

   Ans: A protocol is required to share information among devices in a network. A protocol refers to a pre-defined set of rules by which different parties of a network connect and interact with each other.

7. Expand followings: a) TCP / IP b) OSI c) mbps d) Mbps

   Ans: a) Transmission Control Protocol / Internet Protocol

   b) Open System Interconnection

   c) mega bits per second

   d) Million bytes per second

8. Name the device for the following:

   a) It stands for Modulator Demodulator Ans: **MODEM**

   b) It regenerates the signals Ans: **Repeater**

9. Define Gateway?

   Ans: Gateway is a key access point that acts as a “gate” between an organisation's network and the outside world of the Internet. Gateway serves as the entry and exit point of a network, as all data coming in or going out of a network must first pass through the gateway in order to use routing paths.

10. Write about Router in brief?

    Ans: A router is a network device that can receive the data, analyse it and transmit it to other networks. A router connects a local area network to the internet. A router can be wired or wireless. A wireless router can provide Wi-Fi access to smartphones and other devices.

11. Arjun, a student of Class XII, is little confused about hub and switch. Help him stating any one advantage of switch over hub?

Ans: A hub receives data from one node / server and sends / forwards the data to all other connected devices in that network. On the other hand, a switch extracts the destination address from the data packet and looks it up in a table to see where to send the packet.
Thus it sends signals to only selected devices instead of sending to all. It can also forward multiple packets at the same time.

12. Name any 04 major components of a network?
    Ans: Host, Server, Communication Channel, Network Services
13. Define any 01 difference between an active and a passive hub?
    Ans: Active hub works as a repeater which amplifies signals and forward data, whereas passive sub just forward the data without any amplification.
14. Comment the sentence as a network administrator: "By using resource sharing, network cost can be reduced."
    Ans: In networking, resource sharing means sharing of costly resource (Hardware, software or both) can be implemented easily. Installation of these resources can be in one node (server) and other nodes (clients) can use these resources with some permissions without installation in their workstations.
15. Do you think, "Switch is an intelligent hub"?
    Ans: Yes, a switch is an intelligent hub, because hub just forward the data packets to all other destinations / workstations. But switch checks IP address and sends data to particular destination only.

ASSERTION AND REASONING Based Questions:

Given below are two statements. One labelled as Assertion (A) and the other as Reason (R):

Choose the correct answer from the options given below:

a) Both (A) and (R) are true and (R) is the correct explanation of (A)

b) Both (A) and (R) are true but (R) is not the correct explanation of (A)

c) (A) is true but (R) is false

d) (A) is false but (R) is true

1. Assertion (A): An Intranet is a private network for sharing computing resources and information within an organization

   Reason (R): Intranet is a private version of the Internet.

   Ans: b) Both (A) and (R) are true but (R) is not the correct explanation of (A)

2. Assertion (A): On a computer network the users work on network nodes only.

   Reason (R): A server cannot act as a network node.

Ans: c) (A) is true but (R) is false

3. Assertion (A): There is a difference between a standalone computer and a computer as a network node.

Reason (R): A standalone computer needs a special hardware NIC to be a network node

Ans: a) Both (A) and (R) are true and (R) is the correct explanation of (A)

4. Assertion (A): A server is a computer but not every computer is a server.

Reason (R): A computer having the capabilities to serve the requests of other network nodes is a server.

Ans: a) Both (A) and (R) are true and (R) is the correct explanation of (A)

5. Assertion (A): A router is more powerful and intelligent than hub or switch.

Reason (R): It has advance capabilities as it can analyse the data and decide the data is packed and send to other network.

Ans: a) Both (A) and (R) are true and (R) is the correct explanation of (A)

6. Assertion (A): A repeater is a device that amplifies the data.

Reason (R): A hub is a device which is used to connect more than one device in a network.

Ans: b) Both (A) and (R) are true but (R) is not the correct explanation of (A)

7. Assertion (A): A gateway connects dissimilar networks.

Reason (R): Gateway establishes a connection between local and external networks.

Ans: a) Both (A) and (R) are true and (R) is the correct explanation of (A)

8. Assertion (A): An access point is a device that connects dissimilar networks.

Reason (R): Access point broadcast wireless signals.

Ans: d) (A) is false but (R) is true

9. Assertion (A): A protocol means set of rules to transfer data in a network.

Reason (R): Local area network is an example of protocol.

Ans: c) (A) is true but (R) is false

10. Assertion (A): Router transmits data in more efficient way.

Reason (R): Router maintains a routing table.

Ans: a) Both (A) and (R) are true and (R) is the correct explanation of (A)

11. Assertion (A): In computer networking, a MODEM is considered as both input and output device.

Reason (R): MODEM sends data and receives data at the same time.

Ans: a) Both (A) and (R) are true and (R) is the correct explanation of (A)

12. Assertion (A): Both Client and Server is required to establish a communication.

Reason (R): Server is more powerful than a client.

Ans: b) Both (A) and (R) are true but (R) is not the correct explanation of (A)

13. Assertion (A): A switch is a broadcasting device.

Reason (R): A hub is also a broadcasting device.

Ans: b) Both (A) and (R) are true but (R) is not the correct explanation of (A)

14. Assertion (A): A repeater accepts signals and amplifies and extend the network.

Reason (R): A repeater must always be installed when data has to transmit in long distance.

Ans: c) Both (A) and (R) are true and (R) is the correct explanation of (A)

15. Assertion (A): A hub is a broadcast device.

Reason (R): A switch in intelligent hub.

Ans: d) (A) is false but (R) is true.

COMPUTER NETWORK TOPOLOGIES

MCQs

1.In a star topology, which device is central to all communications?

A) Router

B) Switch

C) Hub

D) Modem

2.Which topology connects all devices to a single backbone cable?

A) Star

B) Bus

C) Mesh

D) Tree

3.In a mesh topology, how many connections are required for 5 devices?

A) 5

B) 10

C) 15

D) 20

4.Which topology provides the highest redundancy?

A) Star

B) Bus

C) Mesh

D) Tree

5.Which topology is often used for large networks with hierarchical layout?

A) Star

B) Bus

C) Mesh

D) Tree

6.In a bus topology, what happens if the main cable fails?

A) Only one device is affected

B) All devices are affected

C) Some devices are affected

D) No devices are affected

7.Which topology is easier to troubleshoot and maintain?

A) Star

B) Bus

C) Mesh

D) Tree

8.Which topology requires the most cabling for full redundancy?

A) Star

B) Bus

C) Mesh

D) Tree

9.In a star topology, if the central hub fails, what happens to the network?

A) Only one device is affected

B) All devices are affected

C) Some devices are affected

D) No devices are affected

10.Which topology connects each device to every other device in the network?

A) Star

B) Bus

C) Mesh

D) Tree

11.Which of the following topologies is the simplest to implement?

A) Star

B) Bus

C) Mesh

D) Tree

12.What is a disadvantage of a bus topology?

A) High cost

B) Difficult to troubleshoot

C) Limited by the length of the backbone

D) No redundancy

13.Which topology is most scalable and flexible?

A) Star

B) Bus

C) Mesh

D) Tree

14.In a tree topology, how are devices connected?

A) Directly to each other

B) To a single central device

C) In a hierarchical manner

D) To a main backbone cable

15.Which topology is commonly used in Wide Area Networks (WANs)?

A) Star

B) Bus

C) Mesh

D) Tree

16 In a mesh topology, what is the main advantage?

A) Cost-effective

B) Simplified cabling

C) High fault tolerance

D) Easy installation

17.What is a common issue in a bus topology with heavy traffic?

A) Collisions

B) Redundancy

C) High cost

D) High fault tolerance

18.Which topology might require a repeater to extend the network?

A) Star

B) Bus

C) Mesh

D) Tree

19.In a tree topology, what can be said about the structure?

A) Linear

B) Non-hierarchical

C) Hierarchical

D) Ring-based

20.Which topology's performance is not affected by adding more devices?

A) Star

B) Bus

C) Mesh

D) Tree

Open sidebar

ASSERTION AND REASONING Based Questions:

Here are 15 multiple-choice questions (MCQs) about computer network topology, using the assertion and reason format:

Question 1

Assertion (A): In a star topology, every node is connected to a central hub.

Reason (R): Star topology is fault-tolerant because a failure in one node or its connection does not affect other nodes.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 2

Assertion (A): In a bus topology, each node is connected to a single cable.

Reason (R): Bus topology allows easy addition of new nodes without disrupting the network.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 3

Assertion (A): Ring topology has a central hub.

Reason (R): In a ring topology, data travels in one direction through the network.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 4

Assertion (A): Mesh topology provides high redundancy.

Reason (R): In mesh topology, every node is connected to every other node.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 5

Assertion (A): In a tree topology, there is only one path between any two nodes.

Reason (R): Tree topology is a combination of star and bus topologies.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 6

Assertion (A): Hybrid topology is used to leverage the advantages of different topologies.

Reason (R): Hybrid topology combines only ring and bus topologies.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 7

Assertion (A): Star topology requires more cable than other topologies.

Reason (R): Star topology directly connects each node to a central hub.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 8

Assertion (A): In bus topology, data collision can be a problem.

Reason (R): Bus topology uses a single communication line for data transmission.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 9

Assertion (A): Mesh topology is the most cost-effective topology.

Reason (R): Mesh topology provides multiple paths between nodes.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 10

Assertion (A): Tree topology is suitable for large networks.

Reason (R): Tree topology allows for easy scalability.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 11

Assertion (A): Star topology is less secure than bus topology.

Reason (R): In star topology, all nodes communicate through a central hub.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 12

Assertion (A): In a ring topology, data travels bidirectionally.

Reason (R): Ring topology can use a dual ring for redundancy.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 13

Assertion (A): Mesh topology provides high fault tolerance.

Reason (R): In mesh topology, each node is connected to multiple nodes.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 14

Assertion (A): Bus topology has a high degree of redundancy.

Reason (R): Bus topology uses a single cable for all network connections.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Question 15

Assertion (A): Hybrid topology can be more complex to implement than other topologies.

Reason (R): Hybrid topology combines characteristics of multiple topologies to meet specific needs.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

CBT questions on computer network topology:

1. In a bus topology network with 8 computers, how many connections (cables) are required to connect all computers?

a). 1

b). 7

c). 8

d). 9

2.In which network topology does each node have a direct connection to every other node in the network?

a) Star topology

b) Mesh topology

c) Bus topology

d) Ring topology

3.Which network topology uses a central connecting point, such as a hub or switch, to connect all nodes in the network?

a) Mesh topology

b) Ring topology

c) Bus topology

d) Star topology

4.In a bus network topology, what happens if there is a break in the main communication line?

a) The entire network becomes inoperable.

b) Only the affected segment of the network becomes inoperable.

c) The network automatically reroutes traffic through alternate paths.

d) The network becomes more efficient due to reduced congestion.

5.Which network topology is commonly used in WLAN (Wireless Local Area Network) deployments, providing flexibility and scalability?

a) Mesh topology

b) Star topology

c) Bus topology

d) Hybrid topology

6.In a ring network topology, how does data travel from one node to another?

a) Data is broadcast to all nodes simultaneously.

b) Data is sent directly to the destination node.

c) Each node forwards the data to the next node in the ring.

d) Data is stored temporarily in a central hub before being forwarded to the destination.

7.Which network topology offers high fault tolerance and redundancy due to multiple paths between nodes?

a) Ring topology

b) Bus topology

c) Mesh topology

d) Star topology

7.Which network topology is susceptible to the "single point of failure" problem if the central connecting point fails?

a) Mesh topology

b) Star topology

c) Bus topology

d) Ring topology

8.In a hybrid network topology, what does "hybrid" refer to?

a) A network topology that combines elements of different topologies.

b) A network topology that consists of only wired connections.

c) A network topology that is entirely wireless.

d) A network topology that is designed specifically for hybrid cloud environments.

9.Which network topology provides the easiest troubleshooting and maintenance due to its centralized nature?

a) Mesh topology

b) Star topology

c) Bus topology

d) Ring topology

Here are five case study-based questions on computer network topology:

Question 1:

TechSolutions Inc. has three remote offices located in different cities. They need a network topology that allows direct communication between all offices while maintaining individual office functionality. Which network topology would you recommend, and why?

Question 2:

ABC Company is a small startup with limited budget and space. They want a cost-effective and easy-to-manage network topology for their office of ten computers. Which network topology would you suggest, and what are its advantages for ABC Company?

Question 3:

XYZ Corporation is expanding rapidly and needs a network topology that can accommodate growth without affecting performance. They have multiple departments with different data sharing needs. Which network topology would best suit XYZ Corporation, and how does it address their requirements?

Question 4:

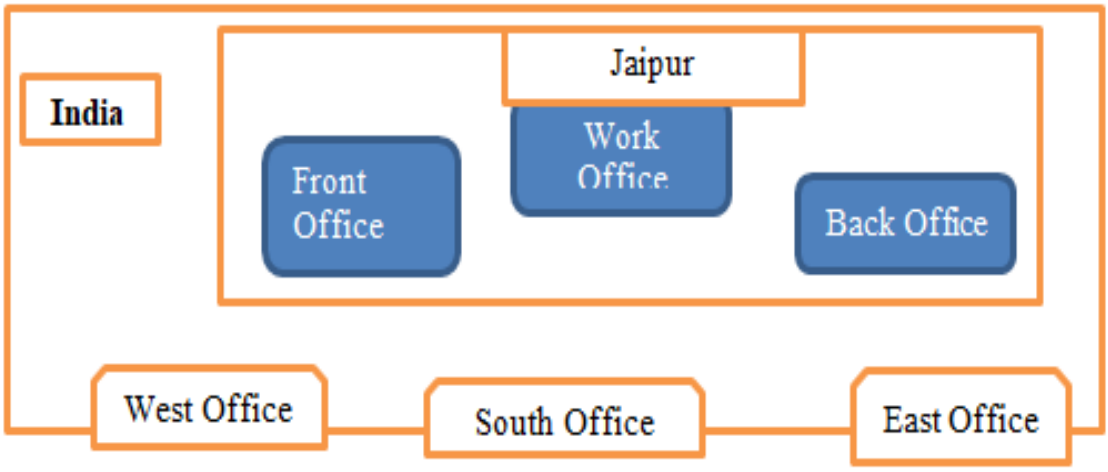
TechGurus Ltd. operates in a high-security environment where data privacy and isolation are critical. They want a network topology that minimizes data leakage risks and unauthorized access. Which network topology would you recommend to TechGurus Ltd., and how does it enhance security?

Question 5:

SmartHome Solutions is designing a network for smart home devices, including security cameras, thermostats, and smart appliances. They need a topology that can handle numerous devices communicating simultaneously without performance degradation. Which network topology would you propose for SmartHome Solutions, and why?

CASE STUDY BASED Questions:

1."Indian Connectivity Solutions" is planning to spread their offices in four major cities in India to provide regional it infrastructure support in field of Education and Culture. The company has planned to setup their Head office in Jaipur in three locations and named their Jaipur offices as "Front Office", "Back Office" And "Work Office". The Company has three more regional offices as "South Office", "East Office" and "West Office" located in other three major cities of India. A rough layout of the same is given below:



Approximate distances between these offices as per network survey team is as follows:

Place From	Place To	Distance
Back Office	Front Office	85 Metre
Front Office	Work Office	40 Metre
Back Office	Work Office	60 Metre
Back Office	East Office	1100 Km
Back Office	West Office	870 Km
Back Office	South Office	2300 Km

In continuation of the above, the Company Experts have planned to install the following number of Computers in each of their Offices:

Back Office	125
Front Office	24
Work Office	55
East Office	55
West Office	60
South Office	60

(i) Suggest a most suitable cable layout Connection to connect all offices situated at Jaipur i.e. Back Office, Front and Work Office. And also write the type of topology for this layout.

(ii) Suggest the most suitable place (i.e. Office) to house the server of this Company with a suitable reason.

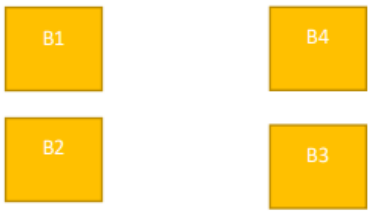
(iii) Suggest the type of Network to connect Back Office, Front and Work Office out of LAN, WAN, MAN and PAN.

(iv) Which device will you suggest to be installed by the company for connecting all the computers with in each of their offices out of the following devices?
(a) Switch/hub (b) Modem (c) Telephone

(v) Which of the following communication medium, will you suggest to be procured by the company for connecting their local offices in Jaipur for very effective and fast communication?

Telephone Cable(b) Ethernet Cable (c) Optical Fibre (d) Co-axial Cable

2. A company ABC Enterprises has four blocks of buildings as shown:



B3 TO B1	50 M
B1 TO B2	60 M
B2 TO B4	25 M
B4 TO B3	170 M
B3 TO B2	125 M
B1 TO B4	90 M

B1	150 M
B2	15 M
B3	15 M
B4	25 M

i) Suggest the most appropriate topology for the connections between the blocks.

a. Ring topology b. Star topology c. Mesh topology d. Bus topology

ii) The company wants internet accessibility in all the blocks. The suitable and cost-effective technology for that would be: a. Satellite b. Lease line c. Telephone line d. Broadband

iii) Which one of the following devices will you suggest for connecting all the computers with in each of their blocks? a. Switch/Hub b. Modem c. Telephone d. Repeater

iv) The company is planning to link its head office situated in New Delhi with the offices in hilly areas. Suggest a way to connect it economically:

a. Micro waves b. Coaxial cable c. Fibre optic d. Radio waves

v) Suggest the most appropriate location of the server, to get the best connectivity for maximum number of computers. a. BLOCK B2 b. BLOCK B1 c. BLOCK B4 d. BLOCK B3

INTRODUCTION TO INTERNET

MCQs

1 URLs are of two types:

(A) Absolute & Relative (B) Static & Dynamic

(C) Absolute and Dynamic (D) None of the above

2. Which amongst the following is an example of a browser?

(A) Mandriva (B) GIMP

(C) Epic (D) Azure

3. Unsolicited commercial emails is known as ……..?

(A) Spam (B) Malware

(C) Virus (D) Worms

4. which protocol allow us to have voice calls over the internet?

(A) HTTP **(B) VoIP**

(C) Video Chat (D) SMTP

5. URL stands for

(a) Universal Resource Locator **(b) Uniform Resource Locator**

(c) Universal Range Limit (d) None of the above

6. An online activity that enables us to publish website or web application on the internet

(a) Web server (b) Web Browser

(c)Web Hosting (d) None

7. GPL stands for _____

(a) General Public License (b) GNU General Private License

(c) GNU General Public License (d) GNU Public License

8. A _____is some lines of malicious code that can copy itself and can have detrimental effect on the computers, by destroying data or corrupting the system.

(a) Cybercrime (b) Computer virus

(c) Program (d) Software

9. What's a web browser ?

a) A kind of spider

b) A computer that store www files

c) A person who likes to look at websites the world wide web

d) A software program that allows you to access sites on the world wide web

Ans. d

10. A _____ is a document commonly written and is accessible through the internet or other network using a browser?

a) Accounts

b) Data

c) Web page

d) Search engine

Ans. C

11. Which of the following is used to read HTML code and to render Webpage?

a) Web Server

b) Web Browser

c) Web Matrix

d) Weboni

Ans. b

12. . A free open source software version of Netscape was the developed called.

a) Opera Mini

b) IE

c) Google Chrome

d) Mozilla

Ans. D

13. Which of the following is considered as latest browser?

a) Mosaic

b) Google Chrome

c) IE

d) Mozilla Firefox

Ans. B

14. Name the first popular web browser is

a) IBM browser

b) Google chorme

c) Mozilla Firefox

d) MOSAIC

Ans. d

15. What is the name of the browser developed and released by Google?

a) Chrome

b) GooglyGoogle

c) Heetson

d) Titanium

Ans. A

16. Which of the following is a Web Browser ?

a) MS-OFFICE b) Notepad

c) Firefox d) Word 2007

Ans. C

16. Cookies are used to do which of the following?

(A) Store your id and password for subsequent logins to the site

(B) Store contents of electronic shopping cart

(C) Track web activity **(D)All of the above**

17. It refers to the proper manner and behaviour we need to exhibit while being online:

(a) Copyright (b) Net behaviour

(c) Nettiquettes (d) Online etiquettes

18. Which of the following is considered a best practice when writing a professional email?

A) Using informal language to establish rapport

B) Including multiple topics in a single email to save time

C) Keeping the email concise and to the point

D) Using emojis and GIFs to add personality

19. Which of the following best defines a website?

A) A collection of computer programs used to manage digital content

B) An electronic device used to access the internet

C) A collection of related web pages and associated content identified by a common domain name

D) A type of social media platform for sharing personal updates

20. **What is e-mail?**

A. Method of exchanging messages via electronic devices
B. Speed message transfer to location
C. Musical messaging service
D. None of these

Answer: A) Method of exchanging messages via electronic devices

ASSERTION AND REASONING Based Questions:

Directions : In the following questions, A statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as

(a) Both A and R are true and R is the correct explanation for A
(b) Both A and B are true and R is not the correct explanation for A
(c) A is true but R is false
(d) A is false and R is true.

1. **Assertion (A) : I**nternet is a global network that connect billions of computer across the world with each other and to the world wide web.

Reason (R) : Internet usage standard internet protocol suite (TCP/IP) to connect billions of computers users worldwide.

Ans : (a) Both A and R are true and R is the correct explanation for A.

2. **Assertion (A) :** Web browser is application software that allows us to view and explore information on the web.

Reason (R) : Web browser can show text, audio, video, animation and more. It is the responsibility of a web browser to interpret text and commands contained in the web page.

Ans : (a) Both A and R are true and R is the correct explanation for A

3. **Assertion (A) :** Email is a method to sends messages from one computer to another computer through the internet.

Reason (R) : Email is the information sent electronically between two or more people over a Network. It involves a sender and receiver/s

Ans : (a) Both A and R are true and R is the correct explanation for A

4. **Assertion (A) :** An Internet troll is a person who deliberately sows discord on the Internet by starting quarrels or upsetting people.

Reason (R) : We can download and use any material available on the Internet.

Ans : (c) A is true but R is false

4. **Assertion (A) : In** March 1989, Tim Berners-Lee took the initiative towards the invention of WWW and wrote the first proposal for the World Wide Web.

Reason (R) : World Wide Web is a way of exchanging information between computers on the internet.

Ans : (b) Both A and B are true and R is not the correct explanation for A

5. **Assertion (A) :** A static web page does not change for each person visiting the web page

Reason (R) : When a web server receives a request for a dynamic web page, it locates and updates the page and send it to the browser of the client

Ans : (c) A is true but R is false

6. **Assertion (A) :** The internet is a world wide collection of network computers, which are able to exchange information with each other very quickly.

Reason (R) : A gateway is a device that connects to similar networks

Ans : (b) Both A and B are true and R is not the correct explanation for A

7. **Assertion (A) :** Uniform Resource Locator (URL) is the address of a resource on the Internet and the protocol used to access it.

Reason (R) : .com is an example of URL of commercial site.

Ans : (c) A is true but R is false

(.com is an example of domain name system. https://websitebuilders.com is an example of URL)

8. **Assertion (A) :** VoIP makes audio and video calls possible from any internet connected device having a microphone and speakers.

Reasoning (R): - VoIP is possible if both caller and receiver have the right software and hardware to speak to one another.

Ans : (a) Both A and R are true and R is the correct explanation for A

9. **Assertion (A) :** Incognito browsing opens up a version of the browser that will track

your activity

Reason (R) : Incognito browsing is useful when entering sensitive data

Ans : (b) Both A and B are true and R is not the correct explanation for A

10. **Assertion (A) :** The Internet is a collection of interconnected computer networks linked by transmission medium such as copper wires, fiber-optic cables, wireless connections etc.

Reason (R) : The World Wide Web is a collection of interconnected documents.

Ans : (b) Both A and B are true and R is not the correct explanation for A

11. **Assertion (A) :** Dynamic webpages are those that are changed as per the location , time and preferences of user.

Reason (R) : Dynamic webpages are manually changed .

Ans : (c) A is true but R is false

12. **Assertion (A) :** Internet is a client server architecture of network

Reason (R) : Clients provide the servers the required information and data.

Ans : (c) A is true but R is false

13. **Assertion (A) :** MODEM stands for modulator-demodulator.

Reason (R) : - It is a computer hardware device that converts data from a digital format to analog and vice versa.

Ans : (a) Both A and R are true and R is the correct explanation for A

14. **Assertion (A) :** - Repeater is device to regenerate a digital signal.

Reason (R) : It has to be installed when data is to be sent on long distance through wired media to avoid loss of signal.

Ans : (a) Both A and R are true and R is the correct explanation for A

15. **Assertion (A) :** - Cookies are plain text files.

Reason (R) : Cookies are not automatically created.

Ans : (c) A is true but R is false

INTRODUCTION TO WEBSITE

MCQs

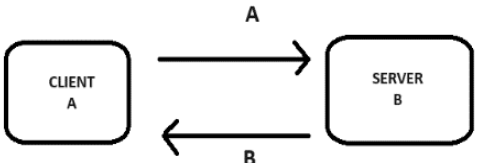
1. Which of the following best describes a static website?
    a) A website that uses client-side scripting to generate content.
    b) A website that displays the same content to every visitor.
    c) A website that allows users to interact and customize content.
    d) A website that requires server-side processing for each request.
2. What technology is commonly used to create dynamic websites?
    a) HTML
    b) CSS
    c) JavaScript
    d) PHP
3. Which of the following is a characteristic of a dynamic website?
    a) Pages are pre-built and delivered as-is to all users.
    b) Content can change based on user interactions or data input.
    c) It requires minimal server-side processing.
    d) It does not support multimedia content.
4. What is the main purpose of a website?
    a) To store data, images and videos
    b) To provide an online presence and share information
    c) To create platform for entertainment
    d) To perform social interaction calculations

5. Which of the following is NOT a web browser?
    a) Google Chrome
    b) Mozilla Firefox
    c) Microsoft Edge
    d) Microsoft Word
6. What does URL stand for?
    a) Universal Resource Locator
    b) Uniform Resource Locator
    c) Unified Resource Locator
    d) Universal Reference Locator
7. Which protocol is commonly used to transfer web pages from a server to a client?
    a) FTP
    b) HTTP
    c) SMTP
    d) IMAP
8. Which statement is true about dynamic websites?
    a) They are typically faster to load than static websites.
    b) They require client-side scripting only.
    c) They can personalize content for different users.
    d) They cannot interact with databases.
9. Which of the following is an example of a static website/web page?
    a) A personal blog with a content management system
    b) An online banking portal
    c) A company's homepage with fixed information
    d) A social media platform
10. An introductory web page that appears when you first open your browser.
    a) Web page
    b) Home page
    c) Web site
    d) Web browser
11. The data storage space accessed via the Internet, usually used to host websites and data files is called.....
    a) Web hosting
    b) Web server
    c) Web space
    d) Web page
12. Which of the following software is responsible for accepting request from client and sending responses to them.
    a) Webserver
    b) Website

c) Web browser
d) Web casting

13. The Extension with which web documents are saved is _____.
    a) c
    b) html
    c) class
    d) css
14. Which of the given is not web server?
    a) iis
    b) tomcat
    c) mysql
    d) apache
15. Which of the following read and render web pages.
    a) Website
    b) Webserver
    c) Web browser
    d) All of the above.
16. Each webpage on the WWW has a unique _____.
    a) IP Address
    b) Website
    c) URL
    d) Web server
17. Each web server has a unique _____.
    a) IP Address
    b) Website
    c) URL
    d) Web page

18.



The arrow B from device B to pointing to A represents?
a. HTTP request
b. HTTP response
c. HTTP request & response
d. All of the above Answer

19. Webpage is a collection of web sites.
    a) True

b) False

20. Web browser is an example of web Client.
    a) True
    b) False

Answers:-

1. b) a website that displays the same content to every visitor.
2. d) php
3. b) Content can change based on user interactions or data input.
4. b) To provide an online presence and share information
5. d) microsoft word
6. b) Uniform Resource Locatord
7. b) HTTP
8. c) They can personalize content for different users.
9. c) A company's homepage with fixed information
10. b) home page
11. c) web space
12. a) webserver
13. b) html
14. c) mysql
15. c) Web browser
16. c) URL
17. a) IP Address
18. b) HTTP response
19. b) false
20. a) true

MLL Questions:

1. What is a web page?

Answer:- A web page is a document on the WWW that is viewed in a web browser

2. What is a static website?

Answer: A static website delivers fixed content to all users without server-side processing.

3. What is a dynamic website?

Answer: A dynamic website generates content based on user interactions and server-side processing.

4. What is a web server?

Answer: A web server is a software or hardware system that store the web content and delivers it to users over the internet.

5. Define the term web hosting?

Answer: Web hosting is a service that provides storage space and access for websites on the internet.

6. What languages are commonly used for static websites?

Answer: HTML, CSS, and JavaScript are commonly used for static websites.

7. What languages are typically used for dynamic websites?

Answer: Dynamic websites often use server-side languages like PHP, Python and JavaScript

8. How do dynamic websites handle user interactions?

Answer: Dynamic websites handle user interactions using server-side processing and databases.

9. What is the primary function of a web server?

Answer: The primary function of a web server is to store, process, and deliver web pages to users.

10. _____ is a collection of related web pages.

    Answer:- Website

11. In _____ website, content of the webpage can not be changed without changing the original code of the web page.

    Answer :- Static website

12. Webserver can be hardware and software both. True or False.

    Answer:- True

13. Give 2 example of webserver softwares.

    Answer:- Apache Server, Tomcat, IIS (Internet Information Services), Nginx etc

14. List any two web hosting services.

    Answer:- Godaddy, wordpress

15. Each web page on internet has unique _____.

    Answer:- URL(Uniform resource locator)

16. Each website on the internet has a unique domain Name. StateTrue or false

    Answer:- True

17. Can static websites handle form submissions?

Answer: Static websites can handle form submissions using client-side scripting and third-party services

ASSERTION AND REASONING Based Questions:

1. Assertion (A): A static website is easier to develop and host compared to a dynamic website.
   Reason (R): Static websites require only HTML, CSS, and JavaScript for their creation.
2. Assertion (A): A dynamic website can offer a better and rich user experience.
   Reason (R): Dynamic websites use server-side scripting to generate content based on user interactions.
3. Assertion (A): Web servers are only used for hosting websites.
   Reason (R): Web servers handle requests from clients and serve web pages in response.
4. Assertion (A): Static websites are inherently more secure than dynamic websites.
   Reason (R): Static websites do not involve server-side processing and databases.
5. Assertion (A): Dynamic websites require database connectivity.
   Reason (R): Dynamic websites store and retrieve data from databases to generate content.

6. Assertion (A): Dynamic websites are static during development and become dynamic after deployment.
   Reason (R): The dynamic nature of a website is defined by the use of server-side technologies.
7. Assertion (A): Static websites cannot be updated without redeploying the files.
   Reason (R): Static websites consist of fixed content delivered exactly as stored.
8. Assertion (A): Web hosting services provide domain name registration.
   Reason (R): Web hosting services focus on storing and serving website files.
9. Assertion (A): Dynamic websites typically use client-side scripting languages.
   Reason (R): Client-side scripting languages are used to enhance user interactivity on dynamic websites.
10. Assertion (A): A web server's primary function is to store and serve web pages.
    Reason (R): Web servers respond to HTTP requests by delivering the requested content.
11. Assertion (A): Static websites can use server-side technologies to improve performance.
    Reason (R): Server-side technologies are exclusive to dynamic websites.
12. Assertion (A): Dynamic websites require more development time compared to static websites.
    Reason (R): Dynamic websites involve server-side scripting, databases, and more complex interactions.
13. Assertion (A) : A dynamic web page gets displayed differently every time it is loaded.
    Reason(R) : Dynamic web pages are a group of different web pages and every time a different web page is loaded.
14. Assertion (A) : A website and the home page of a website has the same URL.
    Reason(R) : The landing page of a website is called home page.
15. Assertion (A) : Webserver is a system that delivers the content to an end user over the internet..
    Reason: Web client is an application that communicates with a web server.

Answers:-

1. A is true, R is true, and R is the correct explanation of A.
2. A is true, R is true, and R is the correct explanation of A.
3. A is false, R is true.
4. A is true, R is true, and R is the correct explanation of A.
5. A is true, R is true, and R is the correct explanation of A.
6. A is false, R is true.
7. A is true, R is true, and R is the correct explanation of A.
8. A is false, R is true.
9. A is false, R is true.
10. A is true, R is true, and R is the correct explanation of A.
11. A is false, R is false.
12. A is true, R is true, and R is the correct explanation of A.
13. A is true but R is false.
14. Both A and R are true and R is the correct explanation of A.
15. Both A and R are true and But R is not the correct explanation of A.

WEB BROWSERS

MCQs

1. What is a web browser?
a) a program that can display a web page
b) a program used to view html documents
c) it enables user to access the resources of internet
d) all of the mentioned

2. An online activity that enables us to publish website or web application on the internet

a) Web server

b) Web Browser

c) Web Hosting

d) None

3. Small text files created by website on clients computer for storing the information of user is called:

a) Web Page

b) Cookies

c) Text File

d) Server

4. which amongst the following is not an example of browser?

a) Chrome

b) Firefox

c) Avast

d) edge

5.Which of the following statements is true?

a)A web cookie is a small piece of data sent from a website and stored in user's web browser while a user is browsing a website.

b)A web cookie is a small piece of data sent from user and stored in the server while a user is browsing a website.

c)A web cookie is a small piece of data sent from root server to all servers.

d)None of these

6.____cookies remain even after the web browser is closed.

a)Session

b)Third-party

c)Permanent

d)Second-party

7.Cookies are used to do which of the following?

a)Store your ID and password for subsequent logons to the site

b)Store contents of electronic shopping carts

c)To track web activity

d)All of the above

8.Which of the following is NOT a common web browser feature?

a)Tabbed browsing

b)Bookmarks

c)Home page

d)Desktop publishing

9. What is a "pop-up blocker" in a web browser used for?

a)To create pop-up advertisements

b)To allow all pop-up windows

c)To prevent unwanted pop-up windows from appearing

d)To display pop-up notifications

10.What does the term "incognito mode" or "private browsing" in web browsers mean?

a)A mode for conducting online shopping

b)A mode that blocks all websites

c)A mode that hides the user's browsing history and cookies

d)A mode for sending anonymous emails

11.Which of the following is not a web browser?

a) Google Chorome
b) Mozilla Firefox
c) Opera
d) **MS word**

12.Which of the following is a web browser?

a) Adobe Photoshop
b) Corel Draw
c) **Apple Safari**
d) MS word

13.Which of the following was the first web browser developed by the National Centre for Supercomputing Application (NCSA)?

a) Google Chrome
b) **Mosaic**
c) Mozilla Firefox
d) Opera

14.Which of the following button allows to move to the next page you visited by pressing back button?

a) **Forward**
b) Next
c) Advanced
d) Ahead

15.The _____ allows to save the web browser address for future use with just a click.

a) **Bookmark**
b) Sync
c) Privacy and Security
d) Search

16.A _____ is a complete program or software that help to extend and modify the functionality of the browser.

a)**plug-in**

b)Add-on

c)Extension

d)Cookies

17.A _____ adds only a particular functionality to the browser.

a)Add-on

b)Plug-in

c)Browser

d)Extension

18.Which of the following is peace of information stored in a form of a text file and that helps in customizing the displayed information, login, showing data based on user's interests from the web site?

a) Extension
b) **Cookies**
c) Login
d) Session

19.Which of the following information can be saved by the auto-fill option?

a) Passwords
b) Payment methods
c) Addresses
d) **All of these**

20. 13. Which of the following is an Indian Web Browser ?

a) Google Chrome
b) Safari
c) Epic
d) IE

MLL Questions:

Q1. Define the term web browser. Give some examples of it

Ans .WEB BROWSER:- It is a software/application that is used to open website on a client/User computer system. E.g Internet explorer, Google Chrome, Mozilla Firefox, opera, safari etc.

Q2. Explain the terms add-ons and plug-ins.

Ans:- ADD-ONS:- An add-on is a program utility or physical device that can be added to a system to enhance its capabilities. PLUG-INS:- It is a small add-on software used to enhance the functionality of a desktop program or a web application.

Q3. You are concerned about online privacy and security. Explain what cookies are, why they are used, and how you can manage them in your web browser.

Ans Cookies are small text files that websites store on a user's device to track user preferences and activities. They are used for personalization and tracking. To manage cookies, you can typically adjust settings in your browser to block or delete them, thereby enhancing privacy and security

Q 4. What is the difference between a web browser and a search engine?

Ans. A web browser is a software application used to retrieve data from webpages, whereas, Search Engine is kind of a website where a user can search for information and the results based on the same are displayed on the screen.

Q 5. What the best web browser examples?

Ans. Given below are the examples of the most commonly used web browsers:

- Google Chrome
- Internet Explorer
- Mozilla Firefox
- Opera

There were web browsers like Netscape Navigator and WorldWideWeb, which were used before the above-mentioned browsers.

Q 6. When was the first web browser released?

Ans. The first web browser which gained public attention was the WorldWideWeb, which was launched in 1990.

Q 7. Ruhani wants to edit some privacy settings of her browser. How can she accomplish her task?

Ans. Steps to edit privacy settings of browser (Mozilla Firefox)

1. Open Mozilla Firefox and click on menu button(right top corner of window)
2. Click on Options.
3. Click on Privacy and Security tab from left panel.
4. Make the changes and close the browser.

Steps to edit privacy settings of browser (Google Chrome)

1. Open browser and pres Alt + F from keyboard.
2. Click on Settings.
3. Click on Privacy and Security tab from left panel.
4. Make the changes and close the browser.

Q8. Shubham wants to play a video in his browser but he is not able to do so. A message on the screen instructs him to install the Adobe Flash Player plugin. Help him to add it in his browser.

Ans. Steps to add Plugin in browser (Mozilla Firefox)

1. Open Mozilla Firefox and click on menu button(right top corner of window)
2. Click on Settings.
3. Click on Extension and Themes from left panel.

4. Click on Plugins.

5. Make the desired selections to enable or disable the required plug-ins.
Q9. When Joe typed a URL in the address bar of his browser, Error 404 was displayed? Why did this happen? What can be done to avoid it?

Ans. If the server is not able to locate the page, it sends a page containing the error message (Error 404- page not found) to the client's browser.

It can be avoided by typing correct address of page.

ASSERTION AND REASONING Based Questions:

1.Assertion (A): - Cookies are plain text files.

Reasoning (R): - Cookies are not automatically created.

2.Assertion(A): Incognito browsing opens up a version of the browser that will track your activity

Reasoning(R): Incognito browsing is useful when entering sensitive data

3.Assertion (A): Cookies are a type of malicious software used to hack websites.

Reason (R): Cookies are small pieces of data stored on a user's computer by websites for various purposes.

5.Assertion(A) Cookies received from various websites are stored by web browser.

Reasoning(R)A web browser is the same thing as a search engine.

6. Assertion (A): Cookies are small text files, stored locally by the client's web browser to remember the "name-value pair" that identifies the client.

Reason (R): Cookies are primarily used to track users' physical locations

7. Assertion (A): A web browser acts as an interface between a user and the World Wide Web.

Reason (R): A user can navigate files, folders, and websites using links on the web pages created with HTML.

8.Assertion(A): A plugin is a piece of software that acts as an add-on to a web browser and gives the browser additional functionality.

Reasoning(R): Plugin is not bounded for browsers only.

9.Assertion(A): add-on is not a complete program.

Reasoning(R) :It is used to add a particular functionality to a browser.

10.Assertion(A): Cookies are not a threat to privacy.

Reasoning(R): Cookies can only be used to store information that the user has volunteered or that the web server already has.

DATA PROTECTION

MLL Questions:

Q.1 What is Data protection techniques?

Ans: Protecting yourself against viruses involves the following safeguards:

- Active Protection
- Use Anti-Virus and Anti-Spyware software.
- Run frequent full-system scans.
- Keep your system up-to-date.
- Disable Cookies through settings.

Q.2 Compare Freeware and Shareware?

ANS: **FREEWARE** is a computer software that is available for use at no cost or for an optional fee. Freeware is generally proprietary software available at zero price and is not free software. The author usually restricts one or more rights to copy, distribute and make derivative works of the software.

SHAREWARE is usually offered as a trial version with certain features only available after the license is purchased, or as a full version, but for a trial period. Once the trial period has passed, the program may stop running until a license is purchased. Shareware is often offered without support, updates, or help menus, which only become available with the purchase of a license. The words "free trial" or "trial version" are indicative of shareware.

Q.3. Differentiate between open source and open data.

ANS: The term 'OPEN SOURCE' is applicable to software, which means source code of a software is freely available and user can make changes in it and reuse it.

The term 'OPEN DATA' is applicable to data that is freely available for everyone to use without any licensing or copyright requirements.

Q.4 EXPEND: OSS, SDLC, FLOSS.

ANS: OSS. Open-Source Software.

SDLC. System Development Life Cycle.

FLOSS. Free Libre/Livre and Open-Source Software.

Q.5 What are intellectual property rights?

ANS: Intellectual property rights are the rights of the owner of information to decide how much information is to be exchanged, shared or distributed. Also it gives the owner a right to decide the price for doing (exchanging/sharing/ distributing) so.

Q.6 Why should intellectual property rights protected?

ANS: The intellectual property rights must be protected because protecting them
encourages individuals and businesses to create new software and new software applications, as well as improving existing applications, ensures new ideas and technologies are widely distributed, promotes investment in the national economy.

Q.7 What do you understand by plagiarism? Why is it a punishable offence?

ANS: Plagiarism is the act of using or stealing someone else's intellectual work, ideas etc. and passing it as your own work. In other words, plagiarism is a failure in giving credit to its source.
Plagiarism is a fraud and violation of Intellectual property rights. Since intellectual property holds a legal entity status, violating its owner's right is a legally punishable offence.

Q.8 What can be done to reduce the risk of identity theft? Write any two ways.

Ans: (i) Use unique ids to Protect your device**s and accounts.**

(ii) Using bio-metric protection

Q.9: Write names of any two common types of Intellectual Property Rights which are protected by the law.

ANS

- Rights upon musical, literary, and artistic works.
- Rights upon discoveries and inventions.
- Words, phrases, symbols, and designs.

- ❖ Copyrights, trademarks, patents, industrial design rights and trade secrets.

Q.10: What is anti-virus software?

ANS: There are a number of malicious software ('malware") programs that can cause damage to computers. These include viruses, worms, Trojan horses (Trojans), malware, spyware etc. Anti-virus software is designed to detect and block attacks from malware. This software when loaded, resides in memory and checks every operation if it is malicious or not. If it finds any suspicious activity, it blocks that operation and saves our computer.

Q.11: I can keep you signed in.

I can remember your site preferences.

I can give you locally relevant content.

Who am I?

ANS: Cookies.

Q.12: Define Digital Certificate?

ANS: Digital Certificates, specially formatted digital information issued to website, are used to verify the identity of the message sender.

Q.13: DIGITAL SIGNATURES?

ANS: Digital signatures are a way of authenticating the identity of creators or producers of digital information.

Q.14: Describe the Pharming security issue and suggest a way of protecting against it.

Ans: It is actually a code installed on the hard drive of a user's computer or on actual web server. Code redirected user to a bogus/fake website without user knowing.

Method of protection:

- ❖ Use filter to authenticate website.
- ❖ User should alert and look for pharming clues .

Q.15: Describe the Phishing security issue and suggest a way of protecting against it.

Ans: In phishing ,creator sends legitimate looking(fake) email in the hope of gaining personal /financial information fake email replicates a well known company e.g. a bank.

Method of protection:

- ISPs can filter/block out phishing emails.
- User should be aware of opening link of emails.

Unit-4 Societal Impacts

MCQs

1. The Information Technology act was notified in which year?
(A)1999 (B) 2001 (C) 2000 (D) 2002
Ans (C) 2000

2. Our digital footprint can be created by _____
(A) visiting any website (B) Sending email
(C). posting online (D). All of the above
Ans (D) All of the above

3. Digital footprints can be used to _____
(A) To know user's location (B). Tracing users activity online
(C) know users like or dislikes on a website . (D) All of the above
Ans (D). All of the above
4. Which of the following are not part of Net Etiquette?
(A). Be Respectful (C) . Be Responsible
(C) Posting your phone number (D). All of the above
Ans (C) Posting your phone number
5. IPR stands for _____
(A) Indian Property Right (B) Intellectual Property Right
(C)Intelligent Property Resource (D)Internet Property Resource

Ans (B) Intellectual Property Right

6. Copying someone's work or idea is referred as
(A) IPR (B) Plagiarism
(C) Patent (D) Trademarks
Ans (B) Plagiarism
7. Source code of software will be protected by _____
(A) copyright (B) patent
(C). registered trademark (D) None of the above
Ans (A) copyright
8. The _____ include right to copy (reproduce) a work, right to distribute copies of the work to the public, and right to publicly display or perform the work.
(A) Copyright (B) Patent
(C) Plagarism (D) None of the above
Ans (A) Copyright
9. A mail or message sent to a large number of people indiscriminately without their consent is called_____
Ans SPAM

10. Which of the following activity does not create any digital footprint?

A. Search online information

B. Online Ticket Booking

C. Saving a word document

D. Responding an email

Ans. C. Saving a word document

11. Which of the following is cybercrime?

(A). Hacking (B). Phishing (C). Spamming (D). All of the above

Ans (D) All of the above

12 _____ is an activity where fake websites or emails that look original or authentic are presented to the user.

(A). Phishing (B). Hacking (C). Spamming (D). Identity theft

Ans (A) Phishing

13. Which of the following act is not termed as Plagiarism.

A. Using some authors work without giving credit to author.

B. Wrongful citation.

C. Modifying someone‟s music composition.

D. Using some authors work with giving credit to author.

Ans (D). Using some authors work with giving credit to author.

14. _____ hackers use their capabilities to uncover security failings to help safeguard organizations from dangerous hackers.

A. Black Hat

B. White Hat

C. Grey Hat

D. None of the above

Ans. B. White Hat

15. Tracking and monitoring a person‟s online activity, and using the internet to stalk or harass an individual is called _____

A. Impersonation

B. Identity theft

C. Harassment

D. Cyberstalking

Ans. D. Cyberstalking

MLL Questions:

1. Write two examples of intellectual property protected by IPR

Ans . Patent: A patent is a type of IPR that protects new and inventive inventions

Copyright: Copyright is another form of IPR that safeguards original literary, artistic, and musical works. For instance, novels, paintings, songs, and computer software code are subject to copyright protection

2. What measures you take to keep data secure

Ans (i) Making regular backups of files

(ii) Using updated antivirus

(iii) Choosing strong password to restrict access and updating it on regular basis.

(iv) No using public / open Wifi

3. Mention any three amendments in Information Technology Amendment Act , 2008

Ans

- Digital Signature gets legal recognition
- Electronic Documents get legal reconition
- Imposition of penalty for damage to computer system

4. What do you mean by Identity theft? Explain with the help of an example

Ans. Identity theft is the crime of obtaining the personal or financial information of another person for the sole purpose of assuming that person's name or identity to make transactions or use it to post inappropriate remarks , comments etc.

Example: Sending text messages/ e-mails pretending some one else's identity

5. Give example of Cyber bullying

Ans. Giving threats online, posting the victim's personal information, or comments aimed to publicly ridicule a victim.

6. What do you mean by Phishing? Explain with the help of an example

Ans. Phishing is a attack often used to steal user data, including login credentials and credit card numbers

Email / web form designed to get victims to purchase gift cards, or to give up personal email or phone numbers

7. What are Importance of IPR in Software Development

Ans. Encouraging Innovation: IPR protection encourages software developers to invest time and resources in creating new and innovative software solutions, knowing that their creations will be protected from unauthorized use or duplication.

Preventing Plagiarism and Piracy: IPR safeguards software from plagiarism and piracy

8. State True / False for following two statements:

i.Shareware software allows you to try the software before you buy it.

ii. Copyright is not the right of the creator of creative/artistic work.
Ans Ans. (i) True (ii) False

9. Define Digital Property
Ans : any information created by a person that exists in digital form , either online or on some other electronic storage

10. Mention any two damages caused by Spamming
Ans .

- Spam reduces productivity
- Spam eats up users time

ASSERTION AND REASONING Based Questions:

For question 1 to 5 answer A, B , C or D as per following details (A) Both Assertion and reason are true and reason correctly explain Assertion
(B) Both Assertion and reason are true but reason is not correct explanation of Assertion
(C)Assertion is true but reason is false
(D) Assertion is false but reason is true

1. **Assertion**: Assertion: Digital footprints are the traces of our online activities.
reasoning: Digital footprints include information like websites visited, social media posts, and online purchases.
Ans A) Both Assertion and reason are true and reason correctly explain Assertion

2. Assertion: It is impossible to control or reduce your digital footprint.
Reasoning: Being mindful of what you share online and using privacy settings can help minimize your digital footprint.
Ans (D) Assertion is false but reason is true

3. Assertion: Intellectual Property Rights protect tangible physical assets.
Reasoning: IPR primarily safeguards creations of the mind, such as inventions and artistic works.
Ans (D) Assertion is false but reason is true

4. Assertion: Paraphrasing a source without proper citation is considered plagiarism.
Reasoning: Paraphrasing without proper attribution is a form of plagiarism, as it involves using someone else's ideas or language without giving them credit.
Ans A) Both Assertion and reason are true and reason correctly explain Assertion

5. Assertion: E-waste is a significant environmental concern in today's digital age. Reason: Electronic devices contain hazardous materials that can harm the environment if not properly

disposed of.
Ans Ans : A) Both Assertion and reason are true and reason correctly explain Assertion

CASE STUDY BASED Questions:

Rahul, a friends of yours, recently encountered a distressing situation. He received an email from an unknown sender claiming to be his classmate. The email contained hurtful and offensive content, making Rahul uncomfortable and worried. Additionally, He was asked to click on a link to view an alleged embarrassing information about him. Rahul is concerned about his online safety and wants to take appropriate actions to address this issue.

1.What type of cyber threat does Rahul situation primarily represent, as described in the case study?
A. Identity theft.
B. Cyberbullying.
C. Data breach.
D. Phishing attack.

2.What is the main concern for Rahul, as mentioned in the case study?
A. Increasing his online presence.
B. Protecting his personal information.
C. Identifying the unknown sender.
D. Encouraging open communication.

3. What actions can Rahul take to address the situation and protect himself, as suggested in the case study?
A. Ignore the email and continue using his email account as usual.
B. Report the incident to a trusted adult, block the sender, and not click on any suspicious links.
C. Reply to the email and ask the sender for more information.
D. Share the offensive email with his friends.

4. Why is it important for individuals to be cautious when encountering suspicious emails or messages, as highlighted in the case study?
A. To increase their online presence.
B. To protect their personal information and safety.
C. To encourage cyberbullying.
D. To share offensive content with others

5.What is the potential consequence of clicking on a suspicious link in an email like the one Rahul received, according to the case study?
A. Nothing significant will happen.
B. The unknown sender will be revealed.

C. It may lead to malware installation or data theft.
D. Rahul will gain popularity online.

Answers:
1.B (Cyberbullying.)
2.B (Protecting his personal information.)
3.B (Report the incident to a trusted adult, block the sender, and not click on any suspicious links.)
4.B (To protect their personal information and safety.)
5.C (It may lead to malware installation or data theft.)

AWARENESS ABOUT HEALTH CONCERNS RELATED TO THE USAGE OF TECHNOLOGY

MCQs

1. When a person can‟t find a balance between their time online and their time offline is a condition called as _____

A. Net Neutrality.

B. Internet Addiction Disorder

C. Hacking

D. Echo Chamber

2. Which of the following is not a health concern in usage of technology.

A. Internet can be addictive

B. Improper posture while using computer can cause backache.

C. Social bonds can become strong.

D. Children tend to play online instead playing games outdoor.

3. Which of the following not a part of digital technologies?

a) Smartphones

b) Computers

c) Internet

d) FM Radio

4. With the outset of Covid-19 schools started Vonline classes but due to continuous online classes students health issues also started. Health practitioner advised the parents to follow a few health tips. Which of the following health tips should not be suggested?

(A) The sitting posture should be correct.

(B) Breaks should be taken in between the online classes.

(C)To protect the eyes the gadgets be placed above eye level.

(D) Wash the eyes regularly

5. Which of the following health concerns is associated with excessive use of smartphones?

A) Digital eye strain

B) Increased attention span

C) Improved posture

D) Reduced risk of obesity

Answer:

A) Digital eye strain

Explanation:

Excessive use of smartphones, especially for prolonged periods, can lead to digital eye strain. Staring at screens for extended periods can cause eye discomfort, dryness, blurred vision, and headaches due to reduced blinking and increased exposure to blue light. Therefore, option A is the correct answer.

It's important to note that while technology has numerous benefits, it is crucial to be aware of the potential health concerns and take appropriate measures to mitigate them, such as practicing healthy screen habits, ensuring ergonomic setups, and taking regular breaks from technology use.

6. Which of the following health concerns is commonly associated with excessive screen time?

a) Carpal tunnel syndrome

b) Sleep disturbances

c) Asthma

d) Vitamin D deficiency

7. Which of the following is a potential health concern associated with prolonged smartphone usage?

a) Hearing loss

b) Migraine headaches

c) Osteoporosis

d) Hypertension

8. Which of the following is a potential risk of improper ergonomic setup while using computers?

a) Seasonal allergies

b) Skin rashes

c) Eye strain

d) Diabetes

9. Which of the following health concerns is associated with excessive use of headphones or earphones?

a) Tinnitus

b) Cataracts

c) Gout

d) Allergic reactions

10. Which of the following is a potential health concern related to sedentary behavior associated with technology use?

a) Iron deficiency anemia

b) Motion sickness

c) Varicose veins

d) Motion sensor syndrome

11.Which of the following health concerns is NOT commonly associated with excessive technology use?

A. Eye strain

B. Neck and back pain

C. Anxiety and depression

D. Improved physical fitness

Answer:

D. Improved physical fitness

12. Excessive use of smartphones and tablets can lead to which of the following health problems?

A) Improved posture

B) Reduced neck and shoulder pain

C) Decreased risk of carpal tunnel syndrome

D) Neck and shoulder pain

Answer: D) Neck and shoulder pain

13. Which of these mental health concerns has research linked to excessive social media use?

A) Increased self-esteem

B) Reduced anxiety

C) Improved mood

D) Depression

Answer: D) Depression

14. Which of the following is NOT a potential health benefit of using fitness tracking devices?

A) Increased physical activity

B) Improved sleep quality

C) Better time management

D) Decreased motivation to exercise

Answer: D) Decreased motivation to exercise

15. Prolonged sitting while using technology can increase the risk of developing which of these health conditions?

A) Improved cardiovascular health

B) Reduced risk of obesity

C) Decreased risk of type 2 diabetes

D) Sedentary behavior-related health issues

Answer: D) Sedentary behavior-related health issues

16. Which of the following is a common side effect of prolonged use of smartphones and tablets?

A) Improved hand-eye coordination

B) Reduced neck and shoulder strain

C) Decreased risk of headaches

D) Neck and shoulder pain

Answer: D) Neck and shoulder pain

17. Excessive use of social media has been linked to an increased risk of which mental health condition?

A) Improved self-esteem

B) Reduced stress levels

C) Increased social connection

D) Anxiety and depression

Answer: D) Anxiety and depression

18. The blue light emitted by digital screens can have which effect on the body's natural sleep-wake cycle?

A) Improves sleep quality

B) Increases melatonin production

C) Disrupts the circadian rhythm

D) Enhances daytime alertness

Answer: C) Disrupts the circadian rhythm

19. Which of the following health benefits is NOT typically associated with the use of fitness tracking devices?

A) Increased physical activity

B) Improved sleep quality

C) Better time management

D) Reduced motivation to exercise

Answer: D) Reduced motivation to exercise

20. Prolonged sitting and sedentary behavior due to technology use can increase the risk of developing which of these health conditions?

A) Improved cardiovascular health

B) Reduced risk of type 2 diabetes

C) Decreased risk of obesity

D) Sedentary behavior-related health issues

Answer: D) Sedentary behavior-related health issues

MLL Questions:

Q:1 What is blue light, and how does it affect health?

A: Blue light is a high-energy visible light emitted by screens of electronic devices. Prolonged exposure to blue light can disrupt sleep patterns and cause eye strain.

Q:2 How does excessive screen time affect mental health?

A: Excessive screen time can contribute to anxiety, depression, and social isolation, especially in children and adolescents.

Q: 3 What are some ergonomic tips to reduce the strain from using technology?

A: Adjust screen brightness, take regular breaks, use ergonomic furniture, and maintain good posture to reduce strain from technology usage.

Q:4 Can technology addiction impact overall well-being?

A: Yes, excessive use of technology can lead to addiction, affecting sleep quality, productivity, and mental health.

Q:5 How does electromagnetic radiation from devices affect health?

A: While research is ongoing, some studies suggest that long-term exposure to electromagnetic radiation from devices like cell phones may increase the risk of certain health issues, though more evidence is needed.

Q:6 Can technology affect physical fitness?

A: Yes, excessive screen time can lead to a sedentary lifestyle, which is linked to various health problems like obesity, cardiovascular issues, and muscle weakness.

Q:7 How can one mitigate the negative health effects of technology usage?

A: Setting limits on screen time, practicing digital detox, incorporating physical activity, and maintaining a balanced lifestyle can help mitigate the negative health effects of technology usage.

Q:8 What is blue light?

A: High-energy visible light emitted by screens, which can disrupt sleep and cause eye strain.

Q:9 Can excessive screen time impact mental health?

A: Yes, contributing to anxiety, depression, and social isolation.

Q:10 How can one reduce strain from technology usage?

A: Adjust brightness, take breaks, and maintain good posture.

Q:11 Does technology addiction affect well-being?

A: Yes, leading to sleep issues, productivity problems, and mental health challenges.

Q:12 Can electromagnetic radiation from devices pose health risks?

A: Studies suggest potential risks, but more research is needed.

Q:13 How does technology affect physical fitness?

A: Excessive screen time can lead to a sedentary lifestyle, impacting fitness negatively.

Q:14 What can one do to minimize health risks from technology?

A: Set screen time limits, practice digital detox, and stay active.

Q. 15 List any two health hazards related to excessive use of Technology.

Ans

(i) Impact on eyes: This is the most common form of health hazard as prolonged hours of screen time can lead to extreme strain in the eyes.

(ii) Sleep problem: Bright light from computer devices block a hormone called melatonin which helps us sleep. Thus we can experience sleep disorders leading to short sleep cycles.

ASSERTION AND REASONING Based Questions:

ASSERTION (A) and REASONING (R) based questions.

Mark the correct choice as

(i) Both (A) and (R) are true and (R) is the correct explanation for (A).

(ii) Both (A) and (R) are true and (R) is not the correct explanation for (A).

(iii) (A) is true and (R) is false.

(iv) (A) is false but (R) is true.

Q. 1.

Assertion (A): According to Environmental Protection Act, 1980, anyone causing the pollution will pay for the damage caused.

Reason (R): The Department of Information Technology (DIT) issued a comprehensive technical guide on "Environmental Management for Information Technology Industry in India."

Ans. Option (iv) is correct.

Explanation: According to Environmental Protection Act, 1986, anyone causing the pollution will pay for the damage caused.

The DIT at the Indian Telephone Industries has set up demonstration projects showing how to recover copper from the Printed Circuit Boards.

Q 2

Assertion: Excessive screen time can lead to digital eye strain.

Reasoning: Staring at screens for long periods can cause eye discomfort, dryness, blurred vision, and headaches due to reduced blinking and increased exposure to blue light.

Ans. Option (i) is correct.

Q.3

Assertion: Sedentary behavior associated with technology use contributes to obesity.

Reasoning: Engaging in prolonged sitting or lying down while using technology reduces physical activity levels, which can lead to weight gain and an increased risk of obesity.

Ans. Option (i) is correct.

Q.4

Assertion: Excessive use of smartphones can cause sleep disturbances.

Reasoning: The blue light emitted by smartphone screens can interfere with the production of melatonin, a hormone that regulates sleep, leading to difficulty falling asleep and disrupted sleep patterns.

Ans. Option (i) is correct.

Q.5

Assertion: Text neck is a health issue caused by the use of mobile devices.

Reasoning: Holding mobile devices at a downward angle for extended periods puts strain on the neck and upper spine, leading to pain, muscle imbalances, and postural issues.

Ans. Option (i) is correct.

Q.6

Assertion: The overuse of social media can’t negatively impact mental health.

Reasoning: Constant exposure to curated and idealized representations of others' lives on social media platforms can contribute to feelings of inadequacy, anxiety, depression, and social isolation.

Ans. Option (iv) is correct.

Q.7

Assertion: Technology addiction can have detrimental effects on overall well-being.

Reasoning: Excessive reliance on technology and the constant need for digital stimulation can not lead to neglect of personal relationships, poor academic or professional performance, and symptoms resembling those of substance addiction.

Ans. Option (iii) is correct.

Q.8

Assertion: Prolonged use of handheld devices can lead to repetitive strain injuries.

Reasoning: The repetitive motions involved in typing, swiping, and scrolling on handheld devices can strain the muscles, tendons, and nerves in the hands, wrists, and fingers, leading to conditions like carpal tunnel syndrome.

Ans. Option (i) is correct.

Q.9

Assertion: Excessive gaming can contribute to physical health problems.

Reasoning: Engaging in long hours of gaming can lead to a sedentary lifestyle, resulting in weight gain, muscular imbalances, and an increased risk of cardiovascular diseases.

Ans. Option (i) is correct.

Q.10

Assertion: The use of headphones or earphones at high volumes can’t cause hearing loss.

Reasoning: Listening to music or other audio content at high volumes through headphones or earphones can damage the delicate structures in the ears, leading to permanent hearing loss or tinnitus.

Ans. Option (iv) is correct.

Q.11

Assertion: Blue light emitted by screens can disrupt the circadian rhythm.

Reasoning: Exposure to blue light, especially in the evening and nighttime hours, can suppress the production of melatonin, disrupt the body's internal clock, and interfere with sleep quality and overall circadian rhythm.

Ans. Option (i) is correct.

Q.12

Assertion: Excessive use of social media can contribute to feelings of low self-esteem and body image dissatisfaction.

Reasoning:The anonymous and pervasive nature of cyberbullying, facilitated by technology, can result in emotional distress, anxiety, depression, and even suicidal thoughts or behaviors among the victims.

Ans. Option (ii) is correct.

Q.13

Assertion: Cyberbullying has significant psychological consequences on its victims.

Reasoning:Constant exposure to carefully curated and filtered images on social media can lead to unrealistic standards of beauty, comparison with others, and a negative impact on self-perception and body image.

Ans. Option (ii) is correct.

Q.14

Assertion: Excessive use of smartphones can lead to decreased attention span.

Reasoning: Constant exposure to notifications, multitasking, and frequent switching between apps and tasks on smartphones can contribute to a decrease in sustained attention and difficulty focusing on one task for an extended period.

Ans. Option (i) is correct.

Q.15

Assertion: Technology use before bedtime can disrupt sleep patterns.

Reasoning:Spending excessive time playing video games can reduce opportunities for social interaction and face-to-face communication, leading to a sense of isolation and difficulty in developing and maintaining social relationships.

Ans. Option (ii) is correct.