CUET (UG) Exam Paper 2025

National Testing Agency

INFORMATICS PRACTICES

(Solved)

[This includes Questions pertaining to Domain Specific Subject only]

Time Allowed: 60 Mins. **Maximum Marks: 250**

General Instructions :

(i) *This Test contains 50 questions.*
(ii) *Five (5) marks will be given for each correct answer.*
(iii) *One (1) mark will be deducted for each incorrect answer.*
(iv) *If more than one option is chosen, then it will be considered as an incorrect answer.*
(v) *Unanswered questions will be given no mark.*

Section–A
Computer Science/Informatics Practices

1. Given Table - 'Employee'

Attributes - Employee ID, Name, Salary

Identify the correct query for performing the following operations:

Increasing the salary by 40% of all employees.

(1) UPDATE EMPLOYEE SET SALARY = SALARY*0.40;
(2) MODIFY EMPLOYEE SET SALARY = SALARY*0.40;
(3) UPDATE EMPLOYEE SET SALARY = SALARY*1.40;
(4) MODIFY EMPLOYEE SET SALARY = SALARY*1.40;

Ans. Option (3) is correct.

Explanation: A 40% increase means you're adding 40% of the current salary to itself:
New Salary=Old Salary+(40% of Old Salary)=Old Salary×1.40

2. Which network topology required a central controller or hub?

(1) Star Topology **(2)** Bus Topology
(3) Tree Topology **(4)** Mesh Topology

Ans. Option (1) is correct.

Explanation: In a star topology, all devices (nodes) are connected to a central controller (hub or switch).
The central hub manages and controls all communication between devices. If the central hub fails, the whole network is affected. This topology definitely requires a central controller or hub.

3. Identify a network where a client can also act as a server if need arises:

(1) Peer-to-Peer Network
(2) Client-Server
(3) Wide Area Network
(4) Personal Area Network

Ans. Option (1) is correct.

Explanation: In a peer-to-peer network, all computers (peers) are equal. There is no dedicated server. Each device can function both as a client and a server, depending on the need.
For example, one computer can share a file (acting as server) while downloading a file from another (acting as client).

4. Table: 'STUDENT'

Roll number	Name	Course
1	Ajay	Science
2	Ankita	Commerce
3	Anmol	Science
4	Bharti	Science
5	Karan	Commerce
6	Mohit	Arts

Consider the given query:

SELECT COURSE, COUNT (*) FROM STUDENT GROUP BY COURSE HAVING COURSE = "Science";

What is the use of the 'HAVING' clause in the above query?

(1) To filter out the column groups.
(2) To filter out the summary groups.
(3) To filter and sort the data.
(4) To filter out the row and column values.

Ans. Option (2) is correct.

Explanation: The SQL query:
- Groups the records by the COURSE column.
- Then, counts the number of students in each course group.
- Finally, the HAVING clause filters the grouped results, keeping only the group where COURSE = "Science".

Key Difference:
- WHERE is used to filter rows before grouping.
- HAVING is used to filter groups after aggregation (i.e., after GROUP BY).

In this case:
We grouped the data by COURSE.
Then HAVING COURSE = "Science" filtered the group where course is "Science".

5. Given a table: 'Student' having attributes [Admission_number, Roll_no, Name, Marks]

The Primary key Admission_number of this table is selected from the set of:

(1) Foreign Keys **(2)** Candidate Keys
(3) Unique Keys **(4)** Alternate Keys

Ans. Option (2) is correct.

Explanation: A candidate key is an attribute (or a set of attributes) that can uniquely identify a row in a table.
A table can have multiple candidate keys. One of these candidate keys is chosen as the primary key.
Primary Key is the main candidate key selected to uniquely identify each record in a table.
In this case, Admission_number is chosen from candidate keys to be the primary key.

6. Identify the syntactically correct SQL query in order to insert a record in the table 'STUDENT' having attributes as admission_no, name, marks.

(1) INSERT INTO STUDENT(201,"RANBIR", 25);
(2) INSERT INTO STUDENT VALUES(201,"RANBIR", 25);
(3) INSERT INTO STUDENT(admission_no, name, marks)(201,"RANBIR", 25);
(4) INSERT INTO STUDENT VALUE(201,"RANBIR", 25);

Ans. Option (2) is correct.

Explanation: Let's break down the correct SQL syntax for inserting data:
INSERT INTO table_name [(column1, column2, ...)] VALUES (value1, value2, ...);
In this case:
- Table name: STUDENT
- Columns (optional if values are in correct order): admission_no, name, marks
- Values: 201, "RANBIR", 25

7. Which concept of the relation is shown by the following query?

SELECT EMPLOYEE.EMPID, EMPLOYEE.NAME, ORDER.ORDERID, ORDER.ORDERDATE
FROM EMPLOYEE, ORDER;

(1) EQUI-JOIN
(2) NATURAL JOIN
(3) OUTER JOIN
(4) CARTESIAN PRODUCT

Ans. Option (4) is correct.

Explanation: This query:
- Selects columns from two tables: EMPLOYEE and ORDER.
- Joins them without any WHERE clause or JOIN condition.

What happens in such a case?
- The query performs a Cartesian Product (also called cross join).
- Every row from EMPLOYEE is paired with every row from ORDER.
- If EMPLOYEE has m rows and ORDER has n rows, the result will have m × n rows.

8. The first computer network was:

(1) NSFNet **(2)** FirstNet
(3) ARPANet **(4)** Internet

Ans. Option (3) is correct.

Explanation: ARPANet (Advanced Research Projects Agency Network) was the first operational computer network and the precursor to the modern Internet. It was developed in late 1960s by the U.S. Department of Defense's ARPA (now DARPA).

9. A table consist of 10 rows and 5 columns. What is the cardinality and degree of the table if 4 rows are deleted and 3 columns are added?

(1) Cardinality = 8 and Degree = 6
(2) Cardinality = 6 and Degree = 8
(3) Cardinality = 7 and Degree = 1
(4) Cardinality = 1 and Degree = 7

Ans. Option (2) is correct.

Explanation: In database terminology:
- Cardinality = Number of rows (records) in a table
- Degree = Number of columns (attributes) in a table

Initial Table:
- Rows = 10
- Columns = 5

Changes:
- 4 rows are deleted → 10 - 4 = 6 rows
- 3 columns are added → 5 + 3 = 8 columns

Final Result:
- Cardinality = 6
- Degree = 8

10. Given table 'st_marks':

roll number	name	marks
1	Shagun	85
2	Sukhi	63
3	Zoya	86
4	Irfan	NULL
5	Maya	52

Find the output:

SELECT AVG(marks) FROM st_marks:

(1) 57.0 **(2)** 71.0
(3) 57.2 **(4)** 71.5

Ans. Option (4) is correct.

Explanation: SELECT AVG(marks) FROM st_marks;
The AVG() function ignores NULL values.
Valid Marks:
85, 63, 86, 52
→ Total = 85 + 63 + 86 + 52 = 286
→ Number of valid values = 4
Average = Total / Count = 286 / 4 = 71.5

11. Which of the following holds **TRUE** about relations in a relation database management system?

(A) Ordering of rows is immaterial.
(B) No two rows are identical.

(C) Ordering of columns is immaterial.
(D) No two columns are identical.
(1) (A), (B) and (C) only
(2) (A), (B) and (D) only
(3) (B), (C) and (D) only
(4) (A), (B), (C) and (D)

Ans. Option (4) is correct.

Explanation: For option (A) Ordering of rows is immaterial.
- In relational databases, tuples (rows) do not have any inherent order.
- The relation is treated as a set of rows.

For option (B) No two rows are identical.
- In the relational model, each row is unique (usually ensured by a primary key or unique constraint).
- Duplicate rows are not allowed.

For option (C) Ordering of columns is technically immaterial.
- Technically, in the theory of relations (mathematical model), the order of columns is immaterial.
- But in practical RDBMS implementations, column order matters (for queries, storage, etc.).
- Thus, this statement is always strictly true in practice.

For option (D) No two columns are identical.
- Each column in a relation must have a unique name.
- No two columns can have the same name.

12. Identify the type of topology that has the benefits of short cable length, simple wiring layout and easy to extend.
(1) Star Topology **(2)** Tree Topology
(3) Bus Topology **(4)** Mesh Topology

Ans. Option (3) is correct.

Explanation: Bus Topology uses a single central cable (the bus) to which all computers and devices are connected.

It is known for:
- Short cable length (since all devices share the same backbone).
- Simple wiring layout (linear structure).
- Easy to extend (just attach more devices to the bus).

13. Identify the correct statement in order to delete all the rows of a table 'EMPLOYEE' without deleting the structure:
(1) DELETE FROM EMPLOYEE;
(2) DELETE TABLE EMPLOYEE;
(3) DROP FROM EMPLOYEE;
(4) DROP TABLE EMPLOYEE;

Ans. Option (1) is correct.

Explanation: The DELETE FROM EMPLOYEE; statement removes all rows (records) from the table but keeps the table structure intact, so you can insert new data later.
It can also have a WHERE clause to delete specific rows, but without it, it deletes all rows.

14. If a database contains duplicate data in multiple data files, this scenario leads to ..... .
(1) Data Integrity **(2)** Data Insecurity
(3) Data Inconsistency **(4)** Data Redundancy

Ans. Option (4) is correct.

Explanation: When a database contains duplicate data in multiple data files, it results in Data Redundancy.
Data Redundancy means storing the same piece of data in more than one place, which can waste storage and lead to further issues like Data Inconsistency.

15. Match **List-I** with **List-II**.

List-I (SQL Query)	List-II (Result)
(A) SELECT DAY ("2010-09-08");	(I) 4
(B) SELECT MONTH("2015-09-08");	(II) 8
(C) SELECT MOD(MONTH("2020-09-03"), 4);	(III) 9
(D) SELECT POW(DAY("2023-02-02"), 2);	(IV) 1

Choose the **correct** answer from the options given below:
(1) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
(2) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)
(3) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)
(4) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Ans. Option (1) is correct.

Explanation: **For option (1)** SELECT DAY('2010-09-08');
DAY() function returns the day part of the date → 08
So, result = 8 → Matches with (II).
For option (2) SELECT MONTH('2015-09-08');
MONTH() function returns the month number → 09
So, result = 9 → Matches with (III).
For option (3) SELECT MOD(MONTH('2020-09-03'), 4);
MONTH('2020-09-03') → 9 (September)
MOD(9, 4) → Remainder when 9 is divided by 4 = 1
So, result = 1 → Matches with (IV).
For option (4) SELECT POW(DAY('2023-02-02'), 2);
DAY('2023-02-02') → 2 (the day)
POW(2, 2) → $2^2 = 4$
So, result = 4 → Matches with (I).

Section–B
Informatics Practices

16. In ..... chart each column represents a range of values and the height of a column corresponds to how many values are in that range.
(1) Histogram **(2)** Bar graph
(3) Frequency polygon **(4)** Boxplot

Ans. Option (1) is correct.

Explanation: A histogram is a graphical representation that organises a group of data points into user-specified ranges. It is similar in appearance to a bar graph, but it groups numbers into ranges, and the height of each bar indicates the frequency of values falling within that range.

17. Which of the following is not a valid plotting function in pyplot?

(1) Scatter() **(2)** barh()
(3) boxplot() **(4)** line()

Ans. Option (4) is correct.

> ***Explanation:*** Matplotlib's pyplot module provides functions for various plots, such as scatter(), barh() and boxplot(). There is no direct line() function; line plots are typically created using plt.plot().

18. Arrange the following steps in the correct order to start using Matplotlib:

(A) import matplotlib. pyplot as plt
(B) Use pip install matplotlib in the command prompt
(C) Start plotting using plt.plot()
(D) Understand the components of a plot (figure, axes, etc.)

Choose the correct answer from the options given below:

(1) (B), (D), (A), (C) **(2)** (A), (D), (B), (C)
(3) (B), (A), (D), (C) **(4)** (A), (B), (C), (D)

Ans. Option (3) is correct.

> ***Explanation:*** To use Matplotlib, you first need to install it (pip install matplotlib). Then, import it into your script (import matplotlib.pyplot as plt). Before plotting, it is beneficial to understand its components (see point (D)), and finally, you can start plotting (see point (C)).

19. Active digital footprints includes data that we intentionally submit online. This would include:

(A) emails
(B) using a mobile App
(C) comments we post on social networking sites
(D) browse Internet

Choose the correct answer from the options given below:

(1) (A), (B) and (D) only **(2)** (A)and (C) only
(3) (A), (B), (C)and (D) **(4)** (A), (B) and (C) only

Ans. Option (2) is correct.

> ***Explanation:*** Active digital footprints refer to data you willingly provide. Sending emails and posting comments are explicit actions that create active digital footprints. Using a mobile app or browsing the internet generally creates passive digital footprints unless specific data is intentionally submitted.

20. ..... is the process of removing a substance from another substance by passing water through it.

(1) E-waste **(2)** Refurbhishing
(3) Leaching **(4)** Carcinogenic

Ans. Option (3) is correct.

> ***Explanation:*** Leaching is the process by which a substance passes through another substance and extracts components from it, often by dissolving them. It describes the removal of substances by passing water through them.

21. Which attribute of plot() function is used to set the style of line in a line chart?

(1) stylline **(2)** plotstyle
(3) styleline **(4)** linestyle

Ans. Option (4) is correct.

> ***Explanation:*** In Matplotlib's plot() function, the linestyle attribute (or ls for short) is used to control the appearance of the line, such as solid, dashed, or dotted.

22. To host a website, arrange the following steps:

(A) Identify a domain name, which best suits our requirement, and get it registered through domain name Registrar.
(B) Upload the files in properly organised folders on the allocated space.
(C) Get domain name mapped to the IP address of the web server.
(D) Select the web hosting service provider that will provide the web server space as well as related technologies and services.

Choose the correct answer from the options given below:

(1) (A), (B), (C), (D) **(2)** (D), (B), (C), (A)
(3) (A), (B), (D), (C) **(4)** (D), (A), (B), (C)

Ans. Option (4) is correct.

> ***Explanation:*** The logical order to host a website is to first choose a web hosting provider (D), then register a suitable domain name (A). After that, upload your website files to the hosting space (B), and finally map your domain name to the web server's IP address (C).

23. What is the correct sequence of data flow in a star topology network when Computer 'A' sends data to Computer 'B'?

(A) The central node (hub or switch) receives the data.
(B) Computer 'A' sends the data to the Central node.
(C) The central node forwards the data to Compuer 'B'.
(D) Computer 'B' receives the data.

Choose the correct answer from the options given below:

(1) (B), (A), (C), (D) **(2)** (A), (B), (C), (D)
(3) (B), (A), (D), (C) **(4)** (A), (B), (D), (C)

Ans. Option (1) is correct.

> ***Explanation:*** In a star topology, all communication passes through a central hub or switch. Therefore, Computer 'A' sends data to the central node (B); the central node receives it (A), then forwards it to Computer 'B' (C); and finally, Computer 'B' receives the data (D).

24. Which of the following command is used to install Pandas from command line?

(1) pip install pandas with pd
(2) pip install pandas
(3) pip install panda
(4) pip install pandaslib

Ans. Option (2) is correct.

> ***Explanation:*** The standard and correct command to install the Pandas library using pip, the Python package installer, is pip install pandas.

25. Match **List-I** with **List-II**.

List-I	List-II
(A) df.fillna(method = 'pad')	(I) Will remove the entire row (object) having the missing value (s) from the DataFrame.
(B) df.fillna(method = 'bfill')	(II) Makes changes in the original DataFrame.
(C) Inplace = true	(III) Replaces the missing value by the value after the missing values.
(D) dropna ()	(IV) Replaces the missing value by the value before the missing value.

Choose the correct answer from the options given below:

(1) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
(2) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)
(3) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)
(4) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Ans. Option (3) is correct.

Explanation: df.fillna(method='pad') (also known as ffill) propagates the last valid observation forward, filling with the value before the missing one (IV).
df.fillna(method='bfill') propagates the next valid observation backward, filling with the value after the missing one (III).
inplace=True modifies the DataFrame directly, rather than returning a new one (II).
dropna() removes rows or columns containing missing values (I).

26. Match **List-I** with **List-II**.

List-I	List-II
(A) Deleting Rows or Column from a DataFrame.	(I) tail(n)
(B) Renaming Row Labels of a DataFrame.	(II) drop()
(C) Joining, Merging and Concatenation of DataFrames.	(III) rename()
(D) To display the last 'n' rows in the DataFrame.	(IV) append()

Choose the correct answer from the options given below:

(1) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
(2) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)
(3) (A)-(I), (B)-(II), (C)-(IV), (D)-(III)
(4) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)

Ans. Option (4) is correct.

Explanation: drop() (II) is used to delete rows or columns (A).
rename() (III) is used to rename row labels (index) or column labels (B).
append() (IV) (though often replaced by concat() in newer Pandas versions) is used for concatenation of DataFrames (C).
tail(n) (I) displays the last 'n' rows of a DataFrame (D).

27. Consider the following DataFrame: 'stationary'?

ITNO	TYPE	PRICE	QTY
101	PENS	200	400
109	PENCILS	100	600
120	ERASERS	300	300
111	SHARPENERS	700	100
124	PENS	10	250

State the output of the following command:

>>>stationary[stationary. TYPE == 'PENS'] ['PRICE']. min (numeric_only = True)

1.	PRICE	10			
2.	ITNO	101 PRICE	10 QTY	100	
3.	ITNO	124 PRICE	10 QTY	250	
4.	ITNO	101 PRICE	10 TYPE	ERASERS QTY	100

Ans. Option (1) is correct.

Explanation: The command first filters the DataFrame to select rows where TYPE is 'PENS'. From these selected rows (ITNO 101 and 124), it accesses the 'PRICE' column and finds the minimum value. Since the prices for 'PENS' are 200 and 10, so the minimum value is 10.

28. The ..... has issued a formal set guidelines for proper and disposal of e-waste.

(1) Information Technology Act
(2) Department of Information Technology
(3) Cyber Appellate Tribunal
(4) Central Pollution Control Board

Ans. Option (4) is correct.

Explanation: In India, the Central Pollution Control Board (CPCB) is the authority responsible for issuing guidelines and regulations on environmental pollution, including the proper handling and disposal of e-waste.

29. Identify the attributes of Pandas Series that assigns a name to the Series 'Ser 1'.

(1) ser 1. name **(2)** ser 1. index. name
(3) Series. name **(4)** pandas. name

Ans. Option (1) is correct.

Explanation: To assign or access the name of a Pandas Series object (e.g., ser1), you use the .name attribute directly on the Series object itself.

30. Write the output produced by the following SQL command:

Select pow(lenght("Informatics Practices"),1);

(1) 0 **(2)** 1
(3) 21 **(4)** 20

Ans. Option (3) is correct.

Explanation: length("Informatics Practices") calculates the length of the string "Informatics Practices", which includes spaces. The length is 21.
pow(X, Y) calculates X raised to the power of Y. So, pow(21, 1) is 21 raised to the power of 1, which equals 21.

31. Match List-I and List-II

List-I	List-II
(A) If a cartesian product is again applied on two tables, what will be the degree of the modified table?	(I) Combines tuples from two tables on specified conditions.
(B) JOIN operation	(II) Sum of the degrees of both the relations.
(C) UNION (U)	(III) To get the common tuples from two tables.
(D) INTERSECT (∩)	(IV) To combine the selected rows of two tables at a time, if some rows are the same in both the tables, then the result will show those rows only once.

Choose the correct answer from the options given below:

(1) (A)-(III), (B)-(II), (C)-(I), (D)-(IV)
(2) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)
(3) (A)-(I), (B)-(II), (C)-(IV), (D)-(III)
(4) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Ans. Option (2) is correct.

Explanation: Cartesian Product: The degree (number of columns) of the resulting table is the sum of the degrees of the original tables (II).
JOIN operation: Combines rows from two or more tables based on a related column between them (I).
UNION (∪): Combines the result sets of two or more SELECT statements, removing duplicate rows (IV).
INTERSECT (∩): Returns only the rows that are common to both result sets of two or more SELECT statements (III).

32. Consider the following DataFrame: 'Product'

INTO	BRAND	PRICE	ITEM
101	WHIRLPOOL	20000	WASHING MACHINE
109	LG	1000	TELEVISION
120	H&M	3000	BLAZER
111	LG	7000	TELEVISION

Write the python code to display the maximum price of LG TV.

(1) Product == 'LG'. max()
(2) Product [Product.BRAND = 'LG']. max()
(3) Product[BRAND]='LG'.max()
(4) Product[Product.BRAND == 'LG'].max()

Ans. Option (4) is correct.

Explanation: To find the maximum price of LG TVs, you first filter the DataFrame to select only rows where the 'BRAND' is 'LG'. Then, you apply the .max() function to find the maximum value within the filtered data. The option Product[Product.BRAND == 'LG'].max() will return the maximum of all columns for 'LG' products, which would include the maximum price.

33. Chatting or Instant Messgaing (IM) over the Internet means communicating to people at different geographic locations in real time through text message (s). Identify the examples of instant messengers.

(A) WhatsApp **(B)** Slack
(C) Yahoo Messenger **(D)** Facebook Messenger

Choose the correct answer from the options given below:

(1) (A), (B), (C) and (D)
(2) (B), (C) and (D) only
(3) (C) and (D) only
(4) (A), (C) and (D) only

Ans. Option (1) is correct.

Explanation: All listed options – WhatsApp, Slack, Yahoo Messenger (historically) and Facebook Messenger – are widely recognised examples of instant messaging applications that allow real-time text communication over the internet.

34. Which function extracts the year value from a data?

(1) CURRENT () **(2)** DAY-YEAR ()
(3) YEAR () **(4)** MONTH()

Ans. Option (3) is correct.

Explanation: In SQL and many programming contexts, the YEAR() function is specifically designed to extract the year component from a date value.

35. Which of the following command for a given dataframe 'ResultDF' will set all values in 'ResultDF' to 0?

(1) ResultDF = 0 **(2)** ResultDF 0
(3) ResultDF [:] = 0 **(4)** ResultDF[:] == 0

Ans. Option (3) is correct.

Explanation: To set all values in a Pandas DataFrame (ResultDF) to 0, the most direct and efficient method is to use ResultDF[:] = 0. This performs an in-place assignment, overwriting all existing elements with the new value.

36. Intellectual Property Right which is usually granted for inventions is known as ..... .

(1) Copyright **(2)** Licensing
(3) Trademark **(4)** Patent

Ans. Option (4) is correct.

Explanation: A patent is a type of intellectual property right that grants its owner the legal right to exclude others from making, using, selling, and importing an invention for a limited period. It is specifically granted for inventions that are new and useful.

37. A web server whether it is local server or a cloud server when connected to the Internet is assigned a unique numeric address on the Internet called ..... address.

(1) WEB **(2)** MAC
(3) IP **(4)** DNS

Ans. Option (3) is correct.

Explanation: Every device connected to the internet, including web servers, is assigned a unique numerical label called an Internet Protocol (IP) address. This address acts as a unique identifier for the device within the network, enabling data to be routed correctly.

38. Based on the geographical area covered and data transfer rate, computer networks are broadly categorised as:

(A) MAN **(B)** PAN
(C) LAN **(D)** WAN

Choose the correct answer from the options given below:

(1) (A), (C) and (D) only **(2)** (A) and (D) only
(3) (A), (B), (C) and (D) **(4)** (A) and (C) only

Ans. Option (3) is correct.

Explanation: Computer networks are typically categorised by their geographical span and data transfer capabilities. All options listed – MAN (Metropolitan Area Network), PAN (Personal Area Network), LAN (Local Area Network) and WAN (Wide Area Network) – are standard classifications of computer networks based on these criteria.

39. Write the output produced by the following SQL command:

SELECT ROUND(342.9234, -1);

(1) 340 **(2)** 342.9
(3) 342.90 **(4)** 340.0

Ans. Option (4) is correct.

Explanation: The ROUND() function rounds a number to a given number of decimal places.
A negative value for the second argument means rounding to the left of the decimal point.
-1 means: round to the nearest 10.
So, 342.9234 rounded to the nearest 10 is → 340.0.

40. https://www.mhrd.gov/

In the above URL, https is the ..... name.

(1) protocol **(2)** subdomain
(3) domain **(4)** browser

Ans. Option (1) is correct.

Explanation: In a URL like https://www.mtbrd.gov/, "https" stands for Hypertext Transfer Protocol Secure. It indicates the protocol being used for secure communication over a computer network, specifying how data is formatted and transmitted.

41. Which type of value will not be considered by SQL while executing the following statement:

SELECT COUNT (column name) FROM TABLE_NAME:

(1) Numeric value **(2)** Text value
(3) Date value **(4)** Null value

Ans. Option (4) is correct.

Explanation: In SQL, the COUNT(column_name) aggregate function counts the number of non-NULL values in a specified column. Therefore, it explicitly excludes rows where the column_name has a NULL value.

42. Match List-I with List-II

List-I	List-II
(A) To display the variance of a DataFrame.	(I) DateFrame.mode()
(B) To display the value that appears the most number of times in a data.	(II) DataFrame.var()
(C) To display the middle value of each column of a DataFrame.	(III) DataFrame.mean()
(D) To display the average of the values of each column of a DataFrame.	(IV) DataFrame. Median()

Choose the correct answer from the options given below:

(1) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
(2) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)
(3) (A)-(II), (B)-(III), (C)-(I), (D)-(IV)
(4) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)

Ans. Option (2) is correct.

Explanation: (A) DataFrame.var() calculates the variance.
(B) DataFrame.mode() returns the most frequently occurring value (mode).
(C) DataFrame.median() returns the middle value (median).
(D) DataFrame.mean() calculates the average (mean).

43. Which of the following are valid customization of pie chart?

(A) Explode **(B)** Whiskers
(C) Autopct **(D)** legend

Choose the correct answer from the options given below:

(1) (A), (C) and (D) only **(2)** (A), (B) and (D) only
(3) (A), (B), (C) and (D) **(4)** (B), (C) and (D) only

Ans. Option (1) is correct.

Explanation: 'Explode' is used to offset a slice, 'Autopct' displays percentage values on slices, and 'legend' adds a key to the chart—all of which are common customisations for pie charts. Whiskers are a component of box plots, not pie charts.

44. Cartesian product operation combines tuples from two relations. The cardinality of the resulting relation is calculated as ..... .

(1) the higher cardinality out of the two relations on which cartesian product is applied.
(2) the sum of the cardinality of relations on which cartesian product is applied.
(3) the difference of the cardinality of relations on which cartesian product is applied.
(4) the product of the cardinality of relations on which cartesian product is applied.

Ans. Option (4) is correct.

Explanation: The Cartesian product operation combines every row from the first relation with every row from the second relation. Therefore, the cardinality (number of rows) of the resulting relation is the product of the cardinalities of the two original relations.

45. Which of the following function will display the descriptive statistical values in a single command?

(1) DataFrame.describe[]
(2) pandas.describe()
(3) DataFrame_describe()
(4) DataFrame.describe()

Ans. Option (4) is correct.

Explanation: The describe() method in Pandas DataFrames generates descriptive statistics, including count, mean, standard deviation, min, max and quartile values, for numerical columns in a single output.

46. Which of the following are well-established Python libraries?

(A) NumPy **(B)** Pandas
(C) Matplotlib **(D)** Series

Choose the correct answer from the options given below:

(1) (A), (B) and (D) only **(2)** (A), (B) and (C) only
(3) (A), (B), (C) and (D) **(4)** (B), (C) and (D) only

Ans. Option (2) is correct.

Explanation: NumPy, Pandas and Matplotlib are all widely used and well-established Python libraries for numerical computing, data manipulation and analysis, and data visualisation, respectively. "Series" is a data structure within Pandas, not a standalone library.

47. The mandatory libraries for facillating import and export of data between Pandas and MySQL are:

(A) pymysql
(2) CSV
(3) DataFrame.
(4) sqlalchemy

Choose the correct answer from the options given below:

(1) (A), (B) and (D) only **(2)** (A), (C) and (D) only
(3) (A), (B), (C) and (D) **(4)** (A) and (D) only

Ans. Option (4) is correct.

Explanation: To connect Pandas with MySQL for data import and export, pymysql is a Python MySQL client library, and sqlalchemy is a SQL toolkit and Object Relational Mapper (ORM) that provides a consistent interface to various databases, including MySQL. CSV and DataFrame are related to data formats and structures within Pandas, not direct database connectivity.

48. State the output of the following code.

```
import pandas as pd
series1 = pd.Series (10, [11, 22, 33])
print(series1)
```

(1) 11 10 22 10 33 10 **(2)** ValueError
(3) 0 10 1 10 2 10 **(4)** 0 11 1 22 2 33

Ans. Option (1) is correct.

Explanation: The code creates a Pandas Series with value 10 and custom indexes [11, 22, 33]. Since only one value is given, it is repeated for all index positions. So, the output shows each index with the value 10.

49. Arrange the following statements in the proper order to plot a bar graph.

(A) save the graph.
(B) display the graph.
(C) import Matplotlib library.
(D) import the records from CSV file in a dataframe.

Choose the correct answer from the options given below:

(1) (D), (C), (B), (A) **(2)** (C), (D), (B), (A)
(3) (D), (C), (A), (B) **(4)** (C), (B), (D), (A)

Ans. Option (2) is correct.

Explanation: To plot a bar graph, first import the Matplotlib library (C), then load the data set from a CSV file into a Data Frame (D). Once the data is ready, display the graph (B) and save it if needed (A).

50. Arrange the following stages from creating a digital footprint to being aware of its impact:

(A) Understand that online activities leave a data trace.

(B) Engage in online activities such as browsing and posting.

(C) Realize that digital footprints can be used to trace users and their activities.

(D) Be cautious about what you write, upload, or download online.

Choose the correct answer from the options given below:

(1) (A), (B), (C), (D) **(2)** (B), (A), (C), (D)

(3) (B), (A), (D), (C) **(4)** (A), (B), (D), (C)

Ans. Option (2) is correct.

Explanation: The logical progression starts with engaging in online activities (B), which then create a digital footprint. Subsequently, one should understand that these activities leave a data trace (A), realise the implications of this data being traceable (C), and finally become cautious about their online actions (D).

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