BRAIN INTERNATIONAL SCHOOL

PRACTICE PAPER 2

Subject – Informatics Practices (065)

CLASS XII

SECTION A

Questions 1 to 21 carry 1 mark each.

Q1. Fill in the blank:

Boolean indexing in a Pandas DataFrame can be used for _____.

(A) Creating a new DataFrame

(B) Sorting data based on index labels

(C) Joining data using labels

(D) Filtering data based on a condition

Q2. Which of the following attributes of a Pandas DataFrame returns the number of rows and columns in the form of a tuple?

(A) df.size

(B) df.shape

(C) df.index

(D) df.dtypes

Q3. Which of the following Python statements is used to write a Pandas DataFrame df to a CSV file?

(A) df.write_csv()

(B) df.export_csv()

(C) df.to_csv()

(D) df.save_csv()

Q4. When two Pandas Series having different index labels are added, the result is:

(A) An error is generated.

(B) Values are added according to their positions.

(C) Values are added according to matching indices, and missing values are represented by NaN.

(D) Only the common index labels are retained.

Q5. Which of the following attributes returns the data type of each column in a Pandas DataFrame?

(A) df.dtype

(B) df.dtypes

(C) df.type

(D) df.datatype

Q6. Which of the following attributes of a Pandas DataFrame returns the column labels?
(A) df.index
(B) df.columns
(C) df.values
(D) df.size

Q7. The purpose of the WHERE clause in a SQL statement is to:
(A) Create a table.
(B) Filter rows based on a specific condition.
(C) Specify the columns to be displayed.
(D) Sort the result based on a column.

Q8. Which SQL operator is used to check whether a column contains NULL values?
(A) = NULL
(B) IS NULL
(C) EQUAL NULL
(D) CHECK NULL

Q9. In SQL, which wildcard character is used with the LIKE operator to represent any sequence of zero or more characters?
(A) _
(B) %
(C) *
(D) #

Q10. Which of the following statements about the SQL BETWEEN operator is correct?
(A) It excludes both boundary values.
(B) It includes both boundary values.
(C) It includes only the lower boundary value.
(D) It includes only the upper boundary value.

Q11. Which SQL keyword is used to eliminate duplicate rows from the result of a SELECT query?
(A) UNIQUE
(B) DISTINCT
(C) DIFFERENT
(D) REMOVE

Q12. Which of the following SQL functions counts only the non-NULL values in a specified column?
(A) COUNT(*)

(B) COUNT(column_name)
(C) SUM(column_name)
(D) AVG(column_name)

Q13. Which of the following networking devices is responsible for routing data packets based on their destination IP addresses?
(A) Modem
(B) Hub
(C) Repeater
(D) Router

Q14. Which of the following transmission media uses light signals for data transmission?
(A) Twisted Pair Cable
(B) Coaxial Cable
(C) Optical Fibre Cable
(D) Telephone Cable

Q15. Which networking device is used to convert digital signals into analog signals and vice versa for transmission over communication lines?
(A) Switch
(B) Modem
(C) Repeater
(D) Gateway

Q16. Shruti receives an email that appears to be from her bank, asking her to click a link and enter her account details. The link directs her to a fraudulent website designed to capture her confidential information. This is an example of:
(A) Cyberbullying
(B) Phishing
(C) Software piracy
(D) Identity theft

Q17. The unauthorised use of another person's personal information to commit fraud or other illegal activities is known as:
(A) Cyberstalking
(B) Identity theft
(C) Plagiarism
(D) Spamming

Q18. Which Intellectual Property Right (IPR) provides protection to a brand name, logo or symbol that distinguishes the goods or services of one organisation from another?

(A) Patent
(B) Copyright
(C) Trademark
(D) Industrial Design

Q19. Which of the following best describes e-commerce?
(A) Conducting business transactions electronically over the Internet.
(B) Sharing files between computers.
(C) Developing computer software.
(D) Sending messages through a local network.

Q20. Assertion (A): A strong password should be unique for every online account.
Reason (R): Reusing the same password across multiple accounts increases the risk of unauthorised access if one account is compromised.
Choose the correct 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.
(C) A is true, but R is false.
(D) A is false, but R is true.

Q21. Assertion (A): Regularly updating software is an important cyber safety practice.
Reason (R): Software updates may include security patches that fix known vulnerabilities.
Choose the correct 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.
(C) A is true, but R is false.
(D) A is false, but R is true.

SECTION B

Questions 22 to 28 carry 2 marks each.
Q22. Mention any two precautions that should be followed while making online financial transactions to ensure the safety of personal and banking information.
Q23. Consider the following Python code:
import pandas as pdstates = pd.Series(['Maharashtra', 'Gujarat', 'Kerala'])capitals = pd.Series(['Mumbai', 'Gandhinagar', 'Thiruvananthapuram'])data = {'State': states, 'Capital': capitals}df = pd.DataFrame(data)df.drop(index=0, inplace=True)print(df)
Write the output of the above code.

Q24. Differentiate between the SQL commands DELETE and DROP TABLE with respect to their purpose and effect on a database.

Q25. Consider the following table named EMPLOYEE:

EmpID	Name	Department	Salary
101	Aman	HR	45000
102	Riya	IT	60000
103	Karan	Sales	52000
104	Meena	IT	75000
105	Rohit	Sales	48000

Write SQL queries to:

I. Display the records of employees working in either the HR or IT department using the IN operator.

II. Display the names of employees in descending order of their salaries.

Q26. What is an Internet Service Provider (ISP)? Mention any two services provided by an ISP.

Q27. Mention any two benefits of e-governance for citizens.

Q28. Differentiate between loc[] and iloc[] attributes of a Pandas DataFrame with suitable examples.

SECTION C

Questions 29 to 32 carry 3 marks each.

Q29. Write a Python program to create the following Pandas DataFrame using a dictionary of lists.

	Name	Age	City
0	Aman	17	Delhi
1	Riya	18	Mumbai
2	Karan	17	Jaipur
3	Meena	18	Lucknow

Q30. Consider the following Pandas DataFrame named df:

Index	Name	Department	Salary
0	Aman	HR	45000
1	Riya	IT	60000
2	Karan	Sales	52000
3	Meena	IT	75000
4	Rohit	Sales	48000

Write Python statements to perform the following tasks:

I. Display the first three rows of the DataFrame using integer position-based indexing.

II. Display the rows at index positions 1 and 3.

III. Display the values of the columns Name and Salary for the rows at index positions 0 to 2.

Q31. Consider the following two tables:

Table: ATHLETE

AthleteID	Name	Country
101	Kartik	INDIA
102	Aman	INDIA
103	Sofia	SPAIN
104	Sandy	USA
105	Ginny	Denmark

Table: MEDALS

AthleteID	Sport	Medals
101	Swimming	8
102	Track	3
103	Gymnastics	5
104	Swimming	2
105	Track	6

Write appropriate SQL queries for the following:

I. Display the sport-wise total number of medals won.

II. Display the names of all athletes other than those belonging to INDIA in ascending order.

III. Display the names of athletes along with their corresponding sports.

Q32. Consider the following table named ORDERS:

OrderID	CustomerName	City	Amount
1001	Asha	Delhi	45000
1002	Rohan	Mumbai	72000
1003	Meera	Delhi	38000
1004	Kabir	Jaipur	55000
1005	Neha	Mumbai	64000

Write SQL queries to perform the following tasks:

I. Display the customer names and amounts of orders where the amount is greater than 50000.

II. Display the city-wise total order amount.

III. Display those cities where the total order amount exceeds 100000.

SECTION D

Questions 33 and 34 carry 4 marks each.

Q33. Write a Python program to generate a bar chart representing the marks scored by students in an examination as given below:

Student Name	Marks Scored
Aman	97
Rishi	78
Karan	56
Kavita	90
Harshita	89

The bar chart should fulfil the following requirements:

I. Display the title as 'Marks scored by the Students'.

II. Display 'Student Name' as the X-axis label.

III. Display 'Marks scored' as the Y-axis label.

IV. Display an appropriate legend with the label 'Marks Scored'.

Q34. Consider the following table named STUDENT:

StudentID	Name	DateofBirth	Marks	City
101	Kritika	2009-03-25	99	Jammu
102	Harsh Kumar	2008-06-03	78	Pathankot
103	Kartik	2009-04-04	90	Jammu
104	Manjot	2010-06-07	75	Amritsar
105	Lovepreet	2009-05-25	88	Jammu

Write the output of the following SQL queries:

I.

```
SELECT Name, LENGTH(Name)
FROM Student
WHERE Marks < 90;
```

II.

```
SELECT DISTINCT(City)
FROM Student;
```

III.

```
SELECT AVG(Marks)
FROM Student;
```

IV.

```
SELECT Name, DateofBirth
FROM Student
WHERE Marks BETWEEN 80 AND 99;
```

SECTION E

Questions 35 to 37 carry 5 marks each.

Q35. Consider the following data showing the average monthly rainfall recorded in a city during the first six months of a year.

Month	Rainfall (in mm)
January	12
February	18
March	25
April	40
May	65
June	110

Write a Python program to generate a line chart representing the monthly rainfall.
The chart should fulfil the following requirements:
I. Store the month names and rainfall values in two separate lists.
II. Plot the rainfall values against the corresponding months using plt.plot().
III. Display suitable markers for the data points.
IV. Add the title 'Monthly Rainfall Analysis' and appropriate labels for both axes.
V. Save the chart as 'Rainfall.png'.

Q36. Sumit has created a table named EXAM as shown below:
Table: EXAM

RegNo	Name	Subject	Marks
1	Suman	Computer Science	85
2	Anil Kumar	Informatics Practices	97
3	Kavita	Hindi	75
4	Manisha	Accounts	60
5	Preeti	Business Studies	68

Help him in writing suitable SQL queries to perform the following tasks:
I. Insert a new record in the table having the following values:
6, 'Harjeet Singh', 'Economics', 80
II. Change the value 'Informatics Practices' to 'IP' in the Subject column.
III. Remove the records of those students whose marks are less than 70.
IV. Add a new column AdmissionDate of suitable data type to the table.
V. Display all records of students whose subject is 'Computer Science'.

Q37. Read the following case study and answer the questions that follow:

A school has developed an online learning portal through which students can access study material, submit assignments and communicate with teachers. The school's IT department is also planning to provide email facilities to students and teachers. The portal is hosted on a web server and can be accessed through the Internet.

Based on the above information, answer the following questions:

I. Which protocol should be used to access the learning portal securely over the Internet?

II. Which protocol is used for sending electronic mail from a client to a mail server?

III. Which protocol is commonly used to retrieve emails from a mail server to a client?

IV. Which protocol is used for transferring files between computers over a network?

V. Name the protocol suite that provides the basic communication framework for data transmission over the Internet.

BRAIN INTERNATIONAL SCHOOL

PRACTICE PAPER 1

Subject – Informatics Practices (065)

CLASS XII

SECTION A

Questions 1 to 21 carry 1 mark each.

Q1. State whether the following statement is True or False:

Slicing can be used to extract a specific portion from a Pandas Series.

Q2. What will be the result of the following SQL query?

SELECT POW(4, 0.5);

(A) 16

(B) 1

(C) 20

(D) 2

Q3. What is plagiarism?

(A) Using copyrighted material without giving proper acknowledgement to the source.

(B) Downloading illegal software.

(C) Spreading misinformation online.

(D) Hacking into computer systems.

Q4. Which of the following Python statements is used to import data from a CSV file into a Pandas DataFrame? (Assume pd is an alias for Pandas.)

(A) pd.open_csv('filename.csv')

(B) pd.read_csv('filename.csv')

(C) pd.load_csv('filename.csv')

(D) pd.import_csv('filename.csv')

Q5. What will be the result of the following SQL query?

SELECT ROUND(4367.647, -2);

(A) 4368

(B) 4367.64

(C) 4367.65

(D) 4400

Q6. E-waste refers to:

(A) Software that has become obsolete.

(B) Data that has been deleted from a storage device.

(C) Viruses that infect computers.

(D) Electronic devices that are no longer in use.

Q7. In a Pandas DataFrame, if the head() function is used without specifying the optional argument indicating the number of rows to display, what is the default number of rows displayed?

(A) 1

(B) 3
(C) 4
(D) 5
Q8. How many Primary Keys can be declared in a table?
(A) 1
(B) 2
(C) 3
(D) 4
Q9. VoIP stands for:
(A) Video Internet Protocol
(B) Voice Internet Protocol
(C) Video Over Internet Protocol
(D) Voice Over Internet Protocol
Q10. Which of the following devices is used for signal amplification while data is being transmitted over a network?
(A) Modem
(B) Switch
(C) Repeater
(D) Router
Q11. In which network topology does the failure of the central connecting device result in the failure of the entire network?
(A) Star
(B) Tree
(C) Mesh
(D) Bus
Q12. The COUNT(*) function provides the total number of _____ within a relation (table) in a relational database.
(A) Columns
(B) Unique values
(C) Non-NULL values
(D) Rows
Q13. While creating a Pandas Series using a dictionary, the keys of the dictionary become:
(A) Values of the Series
(B) Indices of the Series
(C) Data types of the Series
(D) Name of the Series
Q14. In India, the primary law that deals with e-commerce and cybercrime is:
(A) Cybercrime Prevention Act, 2000
(B) Digital Security Act, 2000
(C) Information Technology Act, 2000
(D) E-Commerce Regulation Act, 2008

Q15. Which SQL command is used to divide data into groups having the same value in a column?
(A) ORDER BY
(B) SORT BY
(C) GROUP BY
(D) SORT ON
Q16. Which of the following statements best describes a digital footprint?
(A) A record of a person's online activities.
(B) A password used to access a website.
(C) A computer virus stored on a device.
(D) A physical mark left by a computer.
Q17. Which of the following Python commands selects the first four rows of a DataFrame df, assuming that labelled indices are consecutive integers starting from 0?
(A) df.loc[:3]
(B) df.loc[:2]
(C) df.loc[0:4]
(D) df.loc[1:4]
Q18. What is the use of the MID() function in SQL?
(A) To replace characters in a string.
(B) To extract five characters from the middle of a string only.
(C) To find the position of a substring in a string.
(D) To extract a given number of characters from a specified position in a string.
Q19. Which of the following Python statements creates an empty Pandas Series? (Assume pd is an alias for Pandas.)
(A) pd.Series(None)
(B) pd.series()
(C) pd.Series()
(D) pd.Series.empty()
Q20. Assertion (A): Using someone else's copyrighted work without permission or proper acknowledgement may violate intellectual property rights.
Reason (R): Copyright provides legal protection to the original creators of literary, artistic and other eligible works.
Choose the correct 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.
(C) A is true, but R is false.
(D) A is false, but R is true.
Q21. Assertion (A): Free and Open Source Software (FOSS) allows users to access and modify its source code, subject to its licence terms.
Reason (R): FOSS software can never be redistributed by its users.
Choose the correct 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.
(C) A is true, but R is false.
(D) A is false, but R is true.

SECTION B

Questions 22 to 28 carry 2 marks each.

Q22.

(A) What is a Series in Pandas? Mention any one property of a Series.

OR

(B) What does the term 'library' signify in Python? Mention one use for each of the following libraries:

- Pandas
- Matplotlib

Q23. Anil wants to create a Pandas Series as shown below:

One 1
Two 2
Three 3

Help him complete the following Python code to obtain the desired output.
Note: sdata is a dictionary.

import _____ as pdsdata = _____s = pd._____(sdata)print(s)

Q24. Differentiate between ALTER and UPDATE commands of SQL with suitable examples.

Q25. Write SQL queries to perform the following tasks:

I. Display the name of the month for the date '2025-09-09'.
II. Find and display the position of the substring "ti" in the string "Informatics Practices".

Q26. Differentiate between LAN and WAN. Write any two differences.

Q27. Define digital footprints. Differentiate between active and passive digital footprints.

Q28. Answer the following questions:

I. What is meant by copyright?
II. What is Free and Open Source Software (FOSS)?

SECTION C

Questions 29 to 32 carry 3 marks each.

Q29.

(A) Write a Python program to create a Pandas Series using a NumPy ndarray as shown below. The subject names should be used as indices and the corresponding marks as values.

Subject	**Marks**
Informatics Practices	90
English	78
Economics	80
Business Studies	70

OR

(B) Write a Python program to create the following Pandas DataFrame using a list of dictionaries.

	Course	Duration
0	Computer Application	6
1	Data Science	12
2	Computer Networks	8

Q30. Consider the following table named STUDENTS:

StuRollNo	StuName	StuMarks	StuAdmDate
1	Abhay Kumar	90.0	2025-04-01
2	Riya Sharma	85.5	2025-04-05
3	Karan Mehta	78.0	2025-04-10

Write SQL statements to perform the following tasks:

I. Create a table named STUDENTS with StuRollNo as the Primary Key and appropriate data types for the remaining columns.

II. Insert the following record into the table:

5, ABHAY KUMAR, 90.0, 2025-04-01

Q31. Consider the following tables:

Table: EMPLOYEE

EmpID	EmpName	DeptID
101	Amit	10
102	Riya	20
103	Karan	10
104	Neha	30

Table: DEPARTMENT

DeptID	DeptName
10	HR
20	SALES
30	IT

Write appropriate SQL queries for the following:

I. Display department-wise average salary.

II. Display department names without repetition.

III. Display employee names along with their corresponding department names.

Note: Assume that the EMPLOYEE table contains an additional column named Salary with the following values:

EmpID	Salary
101	45000
102	50000

103	55000
104	60000

Q32. Answer the following questions related to societal impacts of technology:

I. What is cyberbullying?

II. Mention any one precaution that should be taken to protect personal information while using the Internet.

III. What is the purpose of the Information Technology Act, 2000?

SECTION D

Questions 33 and 34 carry 4 marks each.

Q33. Consider the following Pandas DataFrame:

import pandas as pdstudents = pd.Series(['Karan', 'Akriti', 'Suman'])marks = pd.Series([90, 75, 67])data = {'Name': students, 'Marks': marks}df = pd.DataFrame(data)df.rename(columns={'Name': 'SName', 'Marks': 'Score'}, inplace=True)print(df)

Write the output of the above code.

Also answer the following:

I. Name the function used to rename the columns of a DataFrame.

II. What is the purpose of setting inplace=True?

Q34. Kushal, who works as a database designer, has created a table named STUDENT as shown below:

Table: STUDENT

StudentID	Name	City	Marks	AdmissionDate
101	Kunal	Delhi	90	2022-04-15
102	Harish	Mumbai	85	2023-06-20
103	Sunaina	Delhi	95	2022-05-23
104	Kriti	Amritsar	87	2024-04-02
105	Suneel	Mumbai	78	2025-03-03

Write suitable SQL queries for the following:

I. Display the Name and City of all students in lowercase, sorted by Marks in descending order.

II. Display the StudentID along with the name of the month in which the student was admitted.

III. Calculate and display the average marks obtained by students.

IV. Show the names of the cities and the number of students residing in each city.

SECTION E

Questions 35 to 37 carry 5 marks each.

Q35. A school maintains the marks obtained by students in different subjects using Pandas. Consider the following data:

Subject	Marks

English	85
Mathematics	92
Informatics Practices	95
Economics	78
Business Studies	88

Write a Python program to generate a bar chart representing the marks obtained by students in different subjects.
The chart should fulfil the following requirements:
I. Use appropriate lists to store the subject names and marks.
II. Display the subject names on the X-axis and marks on the Y-axis.
III. Add the title 'Subject-wise Performance'.
IV. Add appropriate labels to both axes.
V. Save the chart as 'Performance.png'.

Q36. Write suitable SQL queries for the following:
I. Calculate the exponent for 5 raised to the power of 2.
II. Display the current system date and time.
III. Round off the value 563.6587 to one decimal place.
IV. Remove all leading and trailing spaces from the values of the column User_ID of the table named USER.
V. Display the length of the string 'Have a nice day!'.

Q37. Read the following case study and answer the questions that follow:
MakeInIndia Corporation is planning to establish a new campus in Kashipur. The campus consists of three blocks: App Development, Web Designing and Movie Editing. The number of computers and distances between the blocks are given below.

Block	**Number of Computers**
App Development	50
Web Designing	30
Movie Editing	20

The distances between the blocks are as follows:

- App Development to Web Designing: 55 metres
- Web Designing to Movie Editing: 85 metres
- App Development to Movie Editing: 120 metres

The company also has another campus in Mussoorie, which needs to be connected to the Kashipur campus.
As a network consultant, suggest suitable solutions for the following:
I. Suggest the most appropriate block to house the server. Justify your answer.
II. Which networking device should be installed in each block to connect the computers efficiently?

III. Suggest a suitable wired transmission medium for connecting the three blocks, keeping in mind the given distances.
IV. Draw a suitable cable layout to connect the three blocks economically.
V. What type of network (PAN, LAN, MAN or WAN) would be established to connect the Mussoorie campus with the Kashipur campus?