INFORMATICS PRACTICES (065)

Time allowed: 3 Hours Maximum Marks:70

General Instructions:

- Please check this question paper contains 37 questions.
- All questions are compulsory. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions
- The paper is divided into 5 Sections- A, B, C, D and E.
- Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
- Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
- Section C consists of 4 questions (29 to 32). Each question carries 3 Marks.
- Section D consists of 2 case study type questions (33 to 34). Each question carries 4 Marks.
- Section E consists of 3 questions (35 to 37). Each question carries 5 Marks.
- All programming questions are to be answered using Python Language only.
- In case of MCQ, text of the correct answer should also be written.

Section-A (21 x 1 = 21 Marks)

1.State whether the following statement is True or False: 1
Attribute Series.size can be used to return number of elements from a Pandas Series.

2. The purpose of order by clause in a SQL statement is to: 1
(A) Sort the result in descending order
(B) Filter rows based on a specific condition
(C)Specify the columns to be displayed
(D)Sort the result based on a column in ascending order.

3. Identify the networking device responsible for connecting different types of networks and perform the necessary translation so that the connected networks can communicate properly-- 1
(A)Router (B) Gateway (C)Switch (D)Modem

4. Identify the SQL command used to remove the duplicates at the time of display in a select statement - 1
(A) IN (B) DISTINCT (C)DELETE (D) GROUP BY

5. e-waste refers to: 1
(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

6. Which of the following Python statements can be used to select a column 'EXAM' from a DataFrame df ? 1
(A) df.getcolumn('EXAM') B) df['EXAM']
(C)df.select('EXAM') (D)df('EXAM')

7. Which Python command can be utilised to create a histogram using the data in a list named 'values' that represents scores of students in an exam. 1
(A plt.hist(values) (B) seaborn.histplot(values)
(C) plt.plot_histogram(values) (D) numpy.histogram(values)

8. State whether the following statement is True or False: 1
LENGTH() is not a MATH() function.

9. Which function will be used to read data from a CSV file into pandas data frame? 1
(A). readcsv() (B). to_csv() (C). read_csv() (D). csv_read()

10. _____is the trail of data we leave behind when we visit any website (or use any online application or portal) to fill-in data or perform any transaction. 1
(A). Offline phishing (B). Offline footprint (C). Digital footprint (D). Digital phishing

11, Predict the output of the following query: SELECT UCASE (MONTHNAME ('2023-05-05'));1
(A). MAY (B). 05 (C). may (D). May

12. The device that can operate in place of a hub is- 1
(A. Switch (B). Bridge (C). Router (D). Gateway
13. 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, considering the DataFrame has 10 entries? 1
(A) 0 (B) 1 (C)4 (D)5
14. Legal term to describe the rights of a creator of original creative or artistic work is: 1
(A). Copyright (B). Copyleft (C). GPL (D). FOSS
15. The name "Pandas" is derived from the term: 1
(A). Panel Data (B). Panel Series (C). Python Document (D). Panel Data Frame
16. If column "Fees" contains the data set (5000,8000,7500,5000,8000), what will be the output after the execution of the given query? 1
SELECT SUM (DISTINCT Fees) FROM student;
(A). 20500 (B)i. 10000 (C). 20000 (D). 33500
17. Fill in the Blank Boolean indexing in Pandas DataFrame can be used for _____. 1
(A) Creating a new DataFrame (B) Sorting data based on index labels
(C)Joining data using labels (D)Filtering data based on condition
18.PyPlot is an interface of Python's _____library. 1
(A)panda,pyplot (B)graph.pyplot (C)plot.plyplot
(D)matplotlib.pyplot
19. Collection of hyper linked documents available on the internet is known as_____. 1
(A). Website (B). Webpage (C). Web Server (D). Web Hosting

Q-20 and Q-21 are Assertion (A) and Reason (R) Type questions. Choose the correct option 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

20.Assertion (A):- DataFrame has both a row and column index. 1
Reasoning(R): - A DataFrame is a two-dimensional labelled data structure like a table of MySQL.
21. Assertion (A): In SQL, UPDATE is a Data Definition Language (DDL) Command. 1
Reason (R): DDL commands are used to create, modify, or remove database structures, such as tables.

Section-B (7 x 2 = 14 Marks)

22. What will be the output of the following code: 2

```
>>>import pandas as pd
>>>A=pd.Series(data=[35,45,55,40])
>>>print(A<45)
```

OR

Write the uses of Series.empty and Series.shape attributes of Pandas Series .

23. Mention any four net etiquettes. 2
24. Consider the string: "No alternative of hard work" . Write suitable SQL queries for the following: 2

I. To extract and display "native" from the string.
II. Display the position of the first occurrence of "at" in the given string.

25. Briefly explain the term URL. Also give one example of it. 2

OR

xplain the terms Web page and Home Page.

26. What is the purpose of Order By clause in SQL? Explain with the help of suitable example. 2

27. List any four benefits of e-waste management. 2

28. Mona is writing a Python program to create a DataFrame using a list of list. However, her code contains some mistakes. Identify the errors, rewrite the correct code, and underline the corrections made. 2

```
import Pandas as pd
D1 = {'Name': ['Bimal','Madhu','Rohit'],'Age':[34,47,15],'Address':['X','Y','Z"}}
df = pd.Dataframe(data,Index=[11,12,13])
print(df)
```

OR

Complete the given Python code to get the required output as: 'Madhya Pradesh'

```
import _____ as pd
di = {'Corbett': 'Uttarakhand', 'Sariska': 'Rajasthan', 'Kanha': 'Madhya Pradesh', 'Gir':'Gujarat'}
NP = _____. Series( _____ )
print(NP[ _____ ])
```

Section-C (4 x 3 = 12 Marks)

29. Mr. Roy's family is replacing their old Television with a new one. They decide to throw the old Television in a nearby empty field/plot. 3

I. Explain any one potential environmental hazard associated with improper e-waste disposal.

II. Suggest one responsible way to Ayesha's family for proper disposal of their old Television .

III. Describe the importance of recycling in e-waste management.

30. Write a Python program to create the following DataFrame using a dictionary of dictionaries. 3

	2000	2001	2002
A	200	NaN	200
B	NaN	NaN	400
C	240	500	500

OR

Write a Python Program to create a Pandas Series as shown below using a dictionary. Note that the left column indicates the indices and the right column displays the data.Also write the python code to display the Series in descending order.

SPS	1960
DPS	2001
NPS	2005
GPS	1995
RGS	2013

31. To create a table named SUBJECTS based on the following specification :- 3

Column Name	Data type	Constraints
Sub_No	Integer	Primary Key
Sub_Name	Varchar(25)	
Sub_Teacher	Varchar(30)	
Sub_Classes	Integer	

Write SQL Query to-

i. Add one new column Sub_time ,data type Decimal, size-5,2

ii. Change the data type of Sub_Teacher , varchar to char.

32. Observe the given tables carefully and attempt the following questions: 3

Table:-Employee

Eno	Ename	Job	Salary
1001	Adam	Doctor	150000.00

1002	Amaal	Engineer	165000.00
1003	Ali	Doctor	180000.00
1004	Simran	Manager	125000.00
1005	Rabil	Manager	185000.00

.

Table:-Location

LNO	Location	ENo
1	Kolkata	1004
2	Mumbai	1002
3	Delhi	1003
4	Goa	1001

(A)Write appropriate SQL queries for the following:

(i) Write a SQL query to find the sum of salaries for all jobs.

(ii) Write a SQL query to display EName and corresponding Location for all employees .

(iii) Write a SQL query to display EName,Job and Location for all employees whose salary is above 150000,00.

OR

Consider the following tables:

Table 1: ATHLETE, which stores AthleteID, Name, Country. The table displays basic information of the athletes

Table 2: MEDALS, which stores AthleteID, Sport, and Medals. The table displays the number of medals won by each athlete in their respective sports.

Table: ATHLET

AthleteID	Name	COUNTRY
101	Arjun	INDIA
102	Priya	INDIA
103	Asif	UAE
104	Rozy	USA
105	David	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:

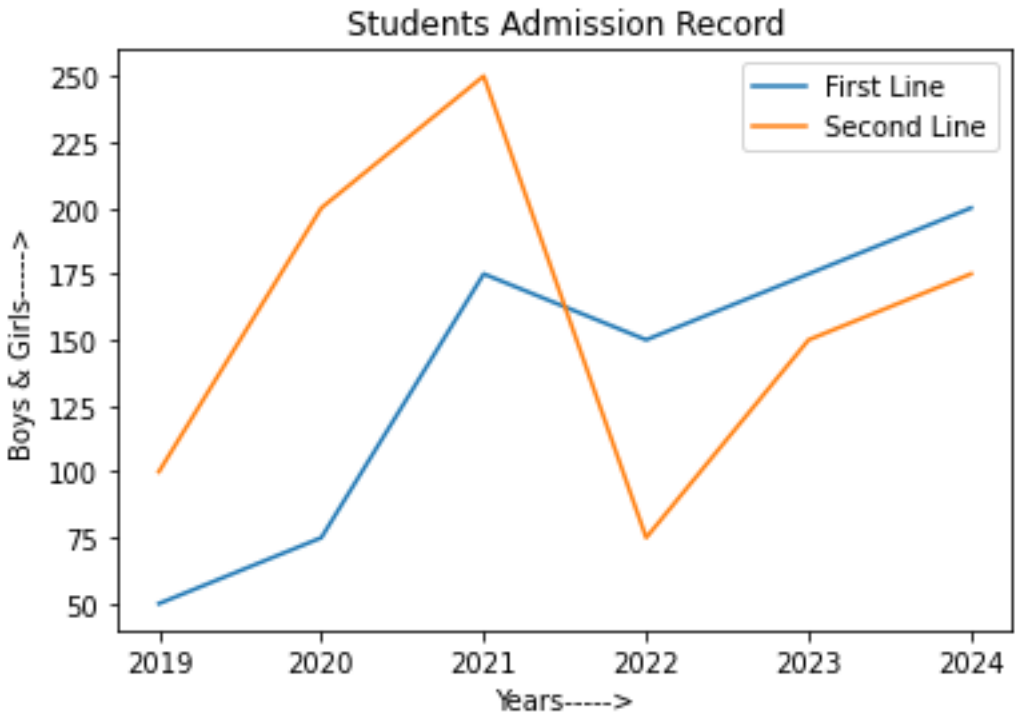
I. Display the sports-wise total number of medals won.

II. Display the names of all the Indian athletes in uppercase.

III. Display the athlete name along with their corresponding sports

Section-D (2 x 4 = 8 Marks)

32. During a practical exam, a student Subham has to fill in the blanks in a Python program that generates a line chart. This line chart represents the admission record of the number of boys and girls against each year . 4




```
import _____.pyplot as plt                    #Statement-1
year=[2019,2020,2021,2022,2023,2024]
boys=[50,75,175,150,175,200]
girls=[100,200,250,75,150,175]
plt.plot(year,boys,label='First Line')
plt._____(year,girls,label='Second Line')     #Statement-2
plt.title('_____')                            #Statement-3
plt._____l('Years----->')                     #Statement-4
plt.ylabel('Boys & Girls----->')
plt.legend()
plt.show()
```

I. Write the suitable code for the import statement in the blank space in the line marked as Statement-1.

II. Refer to the graph shown above and fill in the blank in Statement-2 with suitable Python code.

III. Fill in the blank in Statement-3 with the name of the function to set the label of the title.

III. Refer the graph shown above and fill the blank in Statement-4 with suitable Python Code.

34. Vivan, who works as a database designer, has developed a database for a bookshop. This database includes a table BOOK whose column (attribute) names are mentioned below: 4

BCODE: Shows the unique code for each book.

TITLE: Indicates the book's title.

AUTHOR: Specifies the author's name.

PRICE: Lists the cost of the book.

BCODE	TITLE	AUTHOR	PRIC E
B001	MIDNIGHT'S CHILDREN	SALMAN RUSHDIE	500
B002	THE GOD OF SMALL THINGS	ARUNDHATI ROY	450
B003	A SUITABLE BOY	VIKRAM SETH	600
B004	THE WHITE TIGER	ARAVIND ADIGA	399
B005	TRAIN TO PAKISTAN	KHUSHWANT SINGH	350

A. Write SQL query to-

I. Display author names in uppercase.
II. Display the average price among the books.
III. Display first five characters from each of the book title.
IV. Display the Book Code and Price sorted by Price.

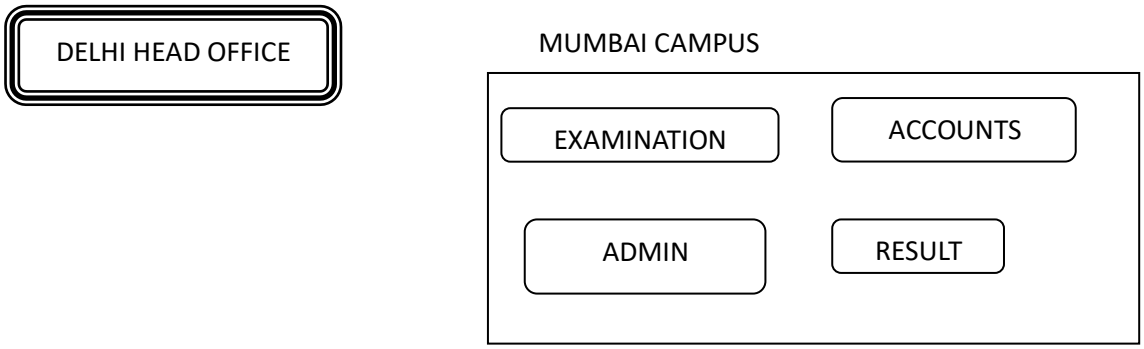
OR

B.Write the output of the following SQL Queries.

I. Select LENGTH(TITLE) from BOOK where PRICE > 400;
II. Select L LCASE(TITLE) from BOOK where LENGTH(AUTHOR)<15;
III. Select MID(AUTHOR,3,3) from BOOK where PRICE between 350 and 450;
IV. Select max(PRICE) from BOOK;

Section-E (3 x 5 = 15 Marks)

35. Prime Computer services Ltd. is an international educational organization. It is planning to set up its India campus at Mumbai with its head office in Delhi. The Mumbai office campus has four main buildings-ADMIN, ACCOUNTS, EXAMINATION and RESULT.
You as a network expert have to suggest the best network related solutions for their problems raised in (i) to (v), keeping in mind the distances between the buildings and other given parameters. 5



Shortest distances between various buildings:

ADMIN TO ACCOUNTS	55 m
ADMIN TO EXAMINATION	90 m
ADMIN TO RESULT	50 m
ACCOUNTS TO EXAMINATION	55 m
ACCOUNTS TO RESULT	50 m
EXAMINATION TO RESULT	45 m
DELHI Head Office to MUMBAI campus	2150 m

Number of computers installed at various buildings are as follows:

ADMIN	110
ACCOUNTS	75
EXAMINATION	40
RESULT	12
DELHI HEAD OFFICE	20

(I)Suggest the most appropriate location of the server inside the MUMBAI campus (out of the four buildings) to get the best connectivity for maximum number of computers. Justify your answer.
(ii)Suggest and draw cable layout to efficiently connect various buildings within the MUMBAI campus for a wired connectivity.

(III)Which networking device will you suggest to be procured by the company to interconnect all the computers of various buildings of MUMBAI campus?

(iv) Company is planning to get its website designed which will allow students to see their results after registering themselves on its server. Out of the static or dynamic, which type of website will you suggest?

(v) Which of the following will you suggest to establish the online face to face communication between the people in the ADMIN office of Mumbai campus and Delhi head office? a) Cable TV b) Email c) Video conferencing d) Text chat.

36. Consider the DataFrame df shown below. 5

	A	B	C	D	E
0	10	20.0	NaN	31	56.0
1	50	40.0	50.0	59	NaN
2	70	NaN	90.0	53	71.0

Write Python statements for the DataFrame df to:

I. Print the first two rows of the DataFrame df.

II. Display only column C.

III. Remove the column D.

IV. Display the data of the 'E' column from indexes 0 to 1 (both included)

V. Rename the column name 'C' to 'Third'.

37.A. Write suitable SQL query for the following: 5

I. To display the lowest score from the test_results column (attribute) in the Exams table

II. To display the last four characters of the registration_number column (attribute) in the Vehicles table. (Note: The registration numbers are stored in the format DL-01-AV-1234)

III.To display the data from the column (attribute) username in the Users table, after eliminating the trailing spaces.

IV. To display the sum of the values in the salary column (attribute) of the Employees table.

V. To determine the count of rows in the Suppliers table.

OR

Write suitable SQL query for the following:

I. Round 678.43267 to three decimal places.

II. Calculate the remainder when 987 is divided by 3.

III. Display the number of characters in the word 'SOUTHEAST'.

IV. Display the 5 characters from the word 'Informatics Practices' starting from ‘f’.

V. Display details from 'Name' column (attribute), in the 'Person' table, after removing any leading and trailing spaces