BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL
PRE BOARD -02 EXAMINATION 2024-25

INFORMATICS PRACTICES (065)
MARKING SCHEME

Class : XII SCIENCE/COMMERCE/ARTS   **Duration : 3 Hrs**
Date   : 13-12-2024   **Max. Marks : 70**
Admission No.:   **Roll No.:**

General Instructions:

Try to attempt all questions as per given order.

All questions are compulsory.

The Question Paper is divided into four sections Section A to D.

- Section A has 13 questions and carry 1 mark each.
- Section B has 14 questions and carry 2 marks each.
- Section C has 7 questions and carry 3 marks each.
- Section D has 2 questions and carry 4 marks each.

Section-A

1. To create an empty Series object, you can use: 1
   (a) pd.Series(empty) **(b) pd.Series( )** (c) pd.Series(np.NaN) (d) all of these

2. Function _____ can be used to drop missing values.   1
   (a) fillna() (b) isnull() **(c) dropna()**   (d) delna()

3. Which method is used to save the output of pyplot in the form of image file?   1
   (a) savefig('filename') (b) save_fig('filename) (c) save_figure('filename')
   (d) save_img('filename')

4. To skip first 5 rows of CSV file, which argument will you give in read_csv() ?   1
   (a) skiprows = 5   (b) skip_rows = 5 (c) skip = 5 (d) noread=5

5. The design of the database is known as ___ ?   1
   (a) Attribute **(b) Database Schema** (c) obstruction (d) Database Oriented

6. Predict the output of the following query: 1
   SELECT LCASE (MONTHNAME ('2023-03-05'));
   a)May **b) March** c)may d) march

7. What is the meaning of "HAVING" clause in SELECT query ?   1
   a) To filter out the summary groups b) To filter out the column groups
   c) To filter out the row and column values d) None of the above.

8. The Cartesian product is also called _____ join.   1
   (a) Equi-Join (b) Natural Join **(c) Unrestricted Join** (d) Restricted Join

9. URLs are of two types: 1
   a) Absolute & Relative b) Static & Dynamic c) Absolute & Dynamic d) None of these.

10. A website is a collection of: 1
a) HTML document b) Graphic files c) Audio & Video Files **(d) All of the above.**

11. By restricting the server and encrypting the data, a software company's server is unethically   1
accessed in order to obtain sensitive information. The attacker blackmails the company to pay
money for getting access to the data, and threatens to publish sensitive information unless
price is paid. This kind of attack is known as:
a) Phishing b) Identity Theft c) Plagiarism **d) Ransomware**

12. Assertion (A) Phishing is fraudulently taking a user to an authentic looking site and stealing   1
user information.
Reasoning(R) Pharming is fraudulently redirecting a website's traffic to another to steal
information.
(a) Both A and R are true and R is the correct explanation for A
(b) Both A and R are true but R is not the correct explanation for A
(c) A is True but R is False
(d) A is false but R is True

13. Assertion (A) Spyware are not harmful as they do not damage data.   1
Reasoning(R) Spyware track data about user and sell it to others hampering your data privacy.
(a) Both A and R are true and R is the correct explanation for A
(b) Both A and R are true but R is not the correct explanation for A
(c) A is True but R is False
(d) A is false but R is True

SECTION - B

14. Write a program to create a series object using a dictionary that stores the number of students
in each house of class 12D of your school.
Note: Assume four house names are Beas, Chenab, Ravi and Satluj having 18, 2, 20, 18   2
students respectively and Pandas library has been imported as pd.

Ans:
```
import pandas as pd
House=['Beas','Chenab','Ravi','Satluj']
Students=[18,2,20,18]
Cl_12D=pd.Series(data=Students,index=House)
Cl_12D
```

15. Consider the Dataframe 'df' as shown below.   2
NOTE: Libraries have been imported.
```
  A  B  C
0 10 20 30
1 40 50 60
```
What will be the output of the following code?
a) print("I :",DF.iloc([0][0]) b) print("II :",DF.loc([0]['C'])

Ans: a) 10 b) 30

16. Write a python code to create a DataFrame with headings (a and b) from the list given below: 2

[[10,30],[15,20],[25,35]]

Ans:
```
import pandas as pd
data=[ [ 10,30],[15,20],[25,35]]
df1=pd.DataFrame(data,columns=['a','b'])
print(df1)
```

17. Given two dataframes 'One' and 'Two' as show below: 2

```
DataFrame 'One':        DataFrame 'Two':
     name   value            name   value
 0    p      1.0         0    p      1.0
 1    q      2.0         1    q      NaN
 2    r      NaN         2    r      3.0
                         3    s      4.0
```

What will be the result of the following ?
(a) One + Two   (b) print(One.radd(Two))

Ans:

```
 1  print(One.add(Two))
```

```
 1  print(One+Two)
```

```
     name   value
 0    pp     2.0
 1    qq     NaN
 2    rr     NaN
 3   NaN     NaN
```

```
     name   value
 0    pp     2.0
 1    qq     NaN
 2    rr     NaN
 3   NaN     NaN
```

18. Consider the following dataframe, and answer the questions given below: 2
    df = pd.DataFrame({ "Quarter1":[2000, 4000, 5000, 4400, 10000], "Quarter2":[5800,
    2500,5400, 3000, 2900], "Quarter3":[20000, 16000, 7000, 3600, 8200], "Quarter4":[1400,
    3700, 1700,2000, 6000]})
    Plot the line graph of data of all the quarters in one chart and also gives the legends to identify
    the quarters.

Ans:
```
import matplotlib.pyplot as plt
import pandas as pd
df = pd.DataFrame({ "Quarter1":[2000, 4000, 5000, 4400, 10000], "Quarter2":[5800,
2500,5400, 3000, 2900], "Quarter3":[20000, 16000, 7000, 3600, 8200], "Quarter4":[1400,
3700, 1700,2000, 6000]})
index=[1,2,3,4,5]
quarter=['Quarter1','Quarter2','Quarter3','Quarter4']
plt.plot(index,df['Quarter1'])
plt.plot(index,df['Quarter2'])
plt.plot(index,df['Quarter3'])
plt.plot(index,df['Quarter4'])
plt.title("Quarterly Data", fontsize=14)
plt.xlabel("Index", fontsize=12)
plt.ylabel("Values", fontsize=12)
plt.legend(title="Quarters")
plt.show()
```

19. Consider the following dataframe ndf as shown below: 2

	Col1	Col2	Col3	Res
T1	62.893165	100.0	60.00	True
T2	94.734483	100.0	59.22	True
T3	49.090140	100.0	46.04	False
T4	38.487265	85.4	58.60	False

What will be the output produced by following statements? (Any two)
a. print(ndf.loc [: , 'Col3' :])
b. print(ndf.iloc[2 : , : 3])
c. print(ndf.iloc [1:3 , 2:3])

Ans: print(prodf.loc[:,'Rice':])
print(prodf.iloc[2:,:3])
print(prodf.iloc[1:3,2:3])

20. A SQL table ITEMS contains the following columns: INO, INAME, QUANTITY, PRICE,   2
DISCOUNT. Write the SQL query to remove the column DISCOUNT from the table.

Ans: ALTER TABLE ITEMS DROP COLUMN DISCOUNT;
OR ALTER TABLE ITEMS DROP DISCOUNT;

21. Consider the given SQL string: 2
"12#All the Best!"
Write suitable SQL queries for the following:
i. Returns the position of the first occurrence of the substring "the" in the given string.
ii. To extract last five characters from the string.

Ans: SELECT instr('12#All the Best!','the') AS Position;
SELECT RIGHT('12#All the Best!', 5) AS LastFiveCharacters;

22. What are aggregate functions in SQL? Name any two example with their output.   2

Ans: Aggregate functions in SQL perform calculations on multiple rows of data and return a single
result. These functions are often used in combination with the GROUP BY clause to group
data and summarize values for specific categories.
Example: SUM()
SELECT SUM(salary) AS TotalSalary FROM Employees;
AVG() SELECT AVG(marks) AS AverageMarks FROM Students;
Other examples: Count( ), Min( ), Max( )

23. What is the difference between a WHERE clause and a HAVING clause of SQL select   2
statement ? Give suitable example.

Ans:

Aspect	WHERE Clause	HAVING Clause
Purpose	Filters rows before any grouping or aggregation occurs.	Filters groups or aggregated data after the GROUP BY operation.
Stage of Execution	Applied before the aggregation phase.	Applied after the aggregation phase.
Usage with Aggregate Functions	Cannot use aggregate functions like SUM , AVG , etc., directly.	Can use aggregate functions like SUM , AVG , etc., directly.
Scope	Operates on individual rows of the table.	Operates on grouped rows.

24. What do you mean by Network Topology ? What are the most popular topology ? Define them with proper diagram.   2

Ans: **Network Topology** refers to the arrangement of various elements (links, nodes, etc.) in a computer network.
Bus, Star, Tree, Mesh, Hybrid

25. Differentiate between Static and Dynamic webpage. Give suitable example.   2

Ans: Static webpages are web pages with fixed content that does not change unless manually updated by a developer. The same content is served to every user who accesses the page, making it straightforward and easy to host.
Dynamic webpages can display different content and allow user interaction by generating pages in real time. They are often driven by databases and server-side scripting languages, allowing for personalized experiences.

26. Sumit got good marks in all the subjects. His father gifted him a laptop. He would like to make Sumit aware of health hazards associated with inappropriate and excessive use of laptop. Help his father to list the points which he should discuss with Sumit.   2

Ans: a) Impact on bones and joints b) Eye Strain c) Slees issues d) Mental health issues
e) Internet addiction disorder.

27. What measures should you take to keep data secure ?   2

Ans: a) Make regular backups b) Running anti-virus c) Use strong passwords d) Safe storage of important files on removable disk.

Section-C

28. A dictionary 'Toys' contains the following: 3
Toys = {'Name':['Doll', 'Ludo', 'Chess' , 'Blocks'], 'Price':[400,250,300,150]}
Write statements for the following:
i) Create a dataframe named "Stock" using dictionary 'Toys'.
ii) Add a column called 'Discount' with the following data. [30,40,15,25]
iii) Delete column discount with all values

Ans: import pandas as pd
# i) Create a dataframe named "Stock" using dictionary 'Toys'.
Toys = {'Name': ['Doll', 'Ludo', 'Chess', 'Blocks'], 'Price': [400, 250, 300, 150]}
Stock = pd.DataFrame(Toys)
print("DataFrame 'Stock':\n", Stock)
# ii) Add a column called 'Discount' with the following data. [30, 40, 15, 25]
Stock['Discount'] = [30, 40, 15, 25]
print("\nDataFrame after adding 'Discount' column:\n", Stock)
# iii) Delete column 'Discount' with all values
Stock.drop(columns=['Discount'], inplace=True)
print("\nDataFrame after deleting 'Discount' column:\n", Stock)

29. Given a dataframe namely **prodf** showing the production of various agricultural yields by four   3
states UP,MP,AP and JK as shown below:

	Fruits	Pulses	Rice	Wheat
UP	44.1	23.2	102.4	120.7
MP	23.5	19.6	87.4	103.5
AP	18.9	12.6	89.4	76.4
JK	10.3	9.7	98.3	78.1

Write code to draw the multiple bar chart showing states on the x axis and production of
various agricultural products on the y axis.

Ans: import pandas as pd
import matplotlib.pyplot as plt
# Create the DataFrame
prodf = pd.DataFrame({ "State": ["UP", "MP", "AP", "JK"], "Wheat": [4000, 2500, 2000, 800], "Rice": [3000, 2000, 3500, 700], "Sugarcane": [5000, 4500, 3000, 500], "Maize": [1500, 1200, 1600, 600]})
# Display the DataFrame
print(prodf)
 import numpy as np
x = np.arange(len(prodf["State"])) # Positions for the states
bar_width = 0.2 # Width of each bar
# Plotting each crop production
plt.figure(figsize=(10, 6))
plt.bar(x - bar_width*1.5, prodf["Wheat"], width=bar_width, label="Wheat")
plt.bar(x - bar_width/2, prodf["Rice"], width=bar_width, label="Rice")
plt.bar(x + bar_width/2, prodf["Sugarcane"], width=bar_width, label="Sugarcane")
plt.bar(x + bar_width*1.5, prodf["Maize"], width=bar_width, label="Maize")
plt.xlabel("States", fontsize=12)
plt.ylabel("Production (in tons)", fontsize=12)
plt.title("Agricultural Production by States", fontsize=14)
plt.legend(title="Crops")

plt.xticks(x, prodf["State"]) # Set the x-axis ticks to the state names
plt.tight_layout()
plt.grid(axis='y', linestyle='--', alpha=0.7)
plt.show()

30. Atul has stored some data in a DataFrame **"MDF"** as shown below. He wants to shift the data to CSV file. 3
Write commands for questions that follow:

YEAR	SALES	LOSS
2001	85	42
2002	75	15
2003	64	62
2004	93	78
2005	67	52

a) To convert the above DataFrame "MDF" to a CSV file "TEXT.CSV"
b) To read and display the CSV file "TEXT.CSV" thus formed without header
c) To delete the column LOSS

Ans: MDF.to_csv("TEXT.CSV", index=False)
print("DataFrame has been saved to 'TEXT.CSV'.")
df_no_header = pd.read_csv("TEXT.CSV", header=None)
print(df_no_header)
MDF["LOSS"] = [10, 20, 15, 12] # Example data
MDF = MDF.drop("LOSS", axis=1)

31. Write a SQL command to create a table "EMPLOYEE" of the given specification: 3
Empno, Ename, Designation, Salary.
Determine the appropriate datatype, dimension and constraints for the above table.
Identify the primary key in the table.

Ans: CREATE TABLE EMPLOYEE (empno INT NOT NULL, ename VARCHAR(50) NOT NULL, desig VARCHAR(50), salary DECIMAL(10, 2), PRIMARY KEY (empno));

32. Based on table **STUDENT** given here, write suitable SQL queries for the following: 3

Roll No	Name	Class	Gender	City	Marks
1	Abhishek	XI	M	Agra	430
2	Prateek	XII	M	Mumbai	440
3	Sneha	XI	F	Agra	470
4	Nancy	XII	F	Mumbai	492
5	Himnashu	XII	M	Delhi	360
6	Anchal	XI	F	Dubai	256
7	Mehar	X	F	Moscow	324
8	Nishant	X	M	Moscow	429

a) Display gender wise highest marks.
b) Display city wise lowest marks.
c) Display total number of male and female students

Ans. a) Select gender, max(marks) from student group by gender;
b) Select city, min(marks) from student group by city;
c) Select gender, count(*) from student group by gender;

33. Consider the following tables CABHUB ns CUSTOMER. Write SQL queries for the following statements.   3
Table: **CABHUB**

VCODE	VEHICLE NAME	MAKE	COLOR	CAPACITY	CHARGES
100	INNOVA	TOYATA	WHITE	7	15
102	SX4	SUZUKI	BLUE	4	14
104	C CLASS	MERCEDES	RED	4	35
105	A-STAR	SUZUKI	WHITE	3	14
108	INDIGO	TATA	SILVER	3	12

Table: CUSTOMER

CCODE	CNAME	VCODE
1	HEMANT SAHU	101
2	RAJ LAL	108
3	FEROZA SHAH	105
4	KETAN DHAI	104

(a) To display the names of all the white colored vehicles.
(b) To display name of vehicle, make and capacity of vehicles in ascending order of their seating capacity.

Ans. (a) Select vehiclename from CABHUB where color='WHITE';
(b) Select vehiclename, make, capacity from CABHUB order by capacity asc;
(c) Select cname, vehiclename from CUSTOMER, CABHUB where CABHUB.CODE = CUSTOMER.VCODE;

34. Explain the difference between the following :   3
a) Plagiarism and Copyright infringement b) Copyright and Patent c) Active and Passive footprints.

Ans: a) Stealing someone else's intellectual property and representing as your own. Use of copyright protected material without the permission of the copyright holder.
b) Collection of rights automatically vested on the creator. He has the right to transfer or distribute to individual or to a group.
c) Intentionally submit data online; passive – unintentionally leave your impression online.

Section-D

35. Consider the following two tables Customer and Salesman   4

SALESMAN TABLE:

SALESMAN ID	NAME	CITY	COMMISSION
5001	James Hoog	New York	0.15
5002	Nail Knite	Paris	0.13
5005	Pit Alex	London	0.11
5006	Mc Lyon	Paris	0.14
5007	Paul Adam	Rome	0.13

CUSTOMER TABLE:

CUSTOMER_ID	CUST_NAME	CITY	GRADE	SALESMAN_ID
3002	Nick Rimando	New York	100	5001
3007	Brad Davis	New York	200	5001
3005	Graham Zusi	California	200	5002
3008	Julian Green	London	300	5002
3004	Fabian Johnson	Paris	300	5006
3009	Geoff Cameron	Berlin	100	5003
3003	Jozy Altidor	Moscow	200	5007

(a) Write a SQL query to display Salesman, cust_name and city from above table where the salesperson and customer belongs to same city.
(b) Write a SQL query to display customer name and city who belongs to London.
(c) Write a SQL query to display Customer Name, City, Salesman, Commission of all the salesperson(s) and their respective customer(s).
(d) Write a SQL query to customer name whose name starts with letter 'G'.

Ans.   (a) Select name,cust_name,city from Salesman, Customer where
Salesman.salesman_id=Customer.salesman_id and Salesman_city=Customer.city;
(b) Select cust_name, city from customer where city='London';
(c) Select cust_name, name,city, commission from Salesman, Customer where
salesman.salesman_id=customer.salesman_id;
(d) Select cust_name from Customer where cust_name like 'G%';

36. XYZ Media house campus is in Delhi and has 4 blocks named Z1, Z2, Z3 and Z4 in Mumbai. 4
The tables given below show the distance between different blocks and the number of computers in each block.

Block Z1 to Block Z2	80 metres
Block Z1 to Block Z3	65 metres
Block Z1 to Block Z4	90 metres
Block Z2 to Block Z3	45 metres
Block Z2 to Block Z4	120 metres
Block Z3 to Block Z4	60 metres

Block	Number of computers
Z1	135
Z2	290
Z3	180
Z4	195

The company is planning to form a network by joining these blocks.

i) Out of the four blocks on campus, suggest the location of the server that will provide the best connectivity. Explain your response.

ii) For very fast and efficient connections between various blocks within the campus, suggest a suitable topology and draw the same.

iii) VoIP technology is to be used which allows one to make voice calls using a broadband internet connection. Expand the term VoIP.

iv) The XYZ Media House intends to link its Mumbai and Delhi centers. Out of LAN, MAN, or WAN, what kind of network will be created? Justify your answer.

Ans. i) Block Z2 ii) STAR topology iii) Voice over Internet Protocol iv) WAN

***** **BEST OF LUCK** *****