



**BK BIRLA CENTRE FOR EDUCATION**  
**SARALA BIRLA GROUP OF SCHOOLS**  
**SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL**  
**MID-TERM EXAMINATION 2023-24**



**INFORMATICS PRACTICES (065)**

**MARKING SCHEME**

**Class : XII SCIENCE/COMMERCE/ARTS**

**Date : 16-10-2023**

**Admission No.:**

**Duration : 3 Hrs**

**Max. Marks : 70**

**Roll No.:**

**General Instructions:**

1. This question paper contains four sections, Section A to D.
2. All questions are compulsory.
3. Section A has 18 MCQ and 10 Very Short Answer type questions carrying 01 mark each.
4. Section B has 11 Short Answer type questions carrying 02 marks each.
5. Section C has 05 Long Answer type Answer questions carrying 03 marks each.
6. Section D has 01 Very Long Answer type questions carrying 05 mark each.
7. All programming questions are to be answered using Python Language only.

**Section-A**

1. To create an empty Series object, you can use : 1  
(a) pd.Series(empty) (b) pd.Series(np.NaN) **(c) pd.Series( )** (d) All of these
2. To get top 5 rows of a DataFrame, you may use \_\_\_\_\_ function. 1  
**(a) head( )** (b) top( ) (c) top(5) (d) None of these
3. Which of the following functions is used to import data from a CSV file into a DataFrame? 1  
**(a) read\_csv()** (b) to\_csv() (c) write\_csv() (d) import\_csv()
4. Which of the following parameters is used to specify the separator character used in the CSV file? 1  
(a) header **(b) sep** (c) index\_col (d) na\_values
5. Which of the following keywords will we use in the following query to display the unique values of the column dept\_name ? 1  
SELECT \_\_\_\_\_ dept\_name FROM Company ;  
(a) All (b) From **(c) Distinct** (d) Name
6. Which of the following is not a numeric function ? 1  
(a) Mod (b) Sign **(c) Mid** (d) Pow
7. By default, ORDER BY clause lists the results in \_\_\_\_\_ order. 1  
(a) Descending (b) Any (c) Same **(d) Ascending**
8. What will be returned by the given query ? 1  
Select INSTR("INFORMATICS","FORM");  
(a) 2 **(b) 3** (c) -2 (d) -3
9. Hub is a : 1  
**(a) Broadcast device** (b) Unicast device (c) Multicast device (d) None of the above
10. Internet is an example of \_\_\_\_\_ topology. 1  
(a) Star (b) Bus **(c) Mesh** (d) Ring

11. URL stands for: 1  
 (a) Universal Resource Locator (b) Universal Resource Location  
**(c) Uniform Resource Locator** (d) None of the above
12. Every activity you perform on the Internet is saved for how long ? 1  
 (a) one month (b) one year (c) as per my setting **(d) forever**
13. In which type of join, the join condition contains an equality operator ? 1  
**(a) Equijoin** (b) Natural (c) Left Join (d) Right Join
14. Switch is a : 1  
 (a) Broadcast device **(b) Unicast device** (c) Multicast device (d) None of the above
15. By default, ORDER BY clause lists the results in \_\_\_\_\_ order. 1  
 (a) Descending (b) Any (c) Same **(d) Ascending**
16. Where and Having clauses can be used interchangeably in SELECT queries ? 1  
 (a) True **(b) False** (c) Only in views (d) With order by
17. When you visit a website, it will open the page set as \_\_\_\_ of the website. 1  
 (a) Web site **(b) Home page** (c) Email (d) ISP
18. IP stands for: 1  
**(a) Internet Protocol** (b) Intranet Protocol (c) Internet Provider (d) Internet Package
19. Given are two objects, a list object namely **list1** and a Series object **Ser1**, both are having similar values i.e., 2, 4, 6, 8. Find out the output produced by following statements: 1  
 (a) print(Ser1 \* 2)

Ans: (a)  
 0 4  
 1 8  
 2 12  
 3 16

20. Name a function to iterate over a DataFrame horizontally. 1

Ans: Iterrows()

21. What functions does Pandas provide to handle missing data ? 1

Ans: Isnull( ), dropna(), fillna()

22. Consider the following program and answer any the questions: 1

(a) import \_\_\_\_\_ as plt  
 (b) plt.\_\_\_\_\_ ('Vertical Bar Chart')

Ans: (a) matplotlib.pyplot  
 (b) title() function

23. Assertion: The to\_csv() function can be used to export a DataFrame to a CSV file. 1  
 Reason: The to\_csv() function is a built-in function in the pandas library that can be used to export a DataFrame to a CSV file. Is the assertion true ?

Ans: The assertion is true because the to\_csv() function can be used to export a DataFrame to a CSV file.

24. Stealing someone else's intellectual work and representing it as own, is called \_\_\_\_\_. 1

Ans: Plagiarism

Write SQL commands for the following queries (a) to (d) based on table/relation Teacher.

**Table: Teacher**

T_ID	Name	Age	Department	Date_of_Join	Salary	Gender
1	Jugal	34	Computer Sci	10-01-2017	12000	M
2	Sharmila	31	History	24-03-2008	20000	F
3	Sandeep	32	Mathematics	12-12-2016	30000	M
4	Sujata	35	History	01-07-2015	40000	F
5	Rakesh	42	Mathematics	05-09-2007	25000	M
6	Shyam	50	History	27-06-2008	30000	M
7	Shiv Om	44	Computer Sci	25-02-2017	21000	M
8	Shashikala	33	Mathematics	31-07-2018	20000	F

25. (a) To show all information about the teacher of History department. 1  
 26. (b) To list the names of female teachers who are in Mathematics department. 1  
 27. (c) To list the names of all teachers with their date of joining in ascending order. 1

Ans: (a) Select \* from teacher where department=' History';  
 (b) Select name from teacher where department='Mathematics' and gender='F';  
 (c) Select name from teacher order by date\_of\_join asc;

28. Write the output of the following SQL commands : **(Any one)** 1  
 (a) Select round(49.88);  
 (b) Select length("INFORMATICS PRACTICES");  
 (c) Select Mod(11,4) "Modulus";

Ans: (a) 50  
 (b) 21  
 (c) 3

### Section-B

29. Create a data series in python and then change the index of the series object. 2

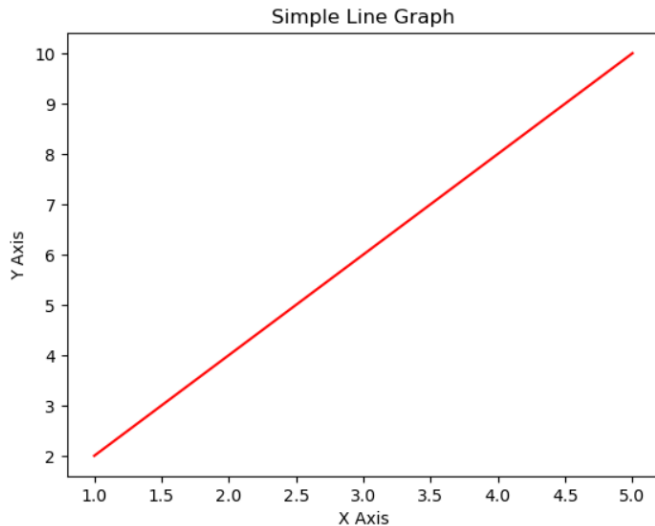
Ans: 

```
import pandas as pd
# create a series
s = pd.Series([1,2,3,4,6])
print(s)
# change the index
s.index = list('ABCDE')
# s=s.reindex(index=['A','B','C','D','E'])
print('Series with new index')
print(s)
```

30. Mr. Amit is confused between Series and DataFrame. Help him to understand the difference between the two with examples. 2

Ans: **Pandas Series**  
 One-dimensional , Homogenous – Series elements must be of the same data type.  
 Size-immutable – Once created, the size of a Series object cannot be changed.  
**Pandas DataFrame**  
 Two-dimensional, Heterogenous – DataFrame elements can have different data types.  
 Size-mutable – Elements can be dropped or added in an existing DataFrame.

31. Write a python program to create a LINE GRAPH as given below 2



Ans: `import matplotlib.pyplot as plt`  
`X=[1,2,3,4,5]`  
`Y=[2,4,6,8,10]`  
`plt.title('Simple Line Graph')`  
`plt.xlabel('X Axis')`  
`plt.ylabel('Y Axis')`  
`plt.plot(X,Y,'r')`  
`plt.show()`

32. You have a CSV file with data about students. The file has the following columns: 2  
**Name, age, gender, grade**  
 Write a Python program to import the data from the CSV file into a DataFrame and display the complete DataFrame.

Ans: `import pandas as pd`  
`df = pd.read_csv('students.csv')`  
`print(df)`

33. Write SQL statement to add a column "COUNTRY" with data type and size as VARCHAR(70) to the existing table named "PLAYER". Is it a DDL or DML or TCL command ? 2

Ans: `Alter table PLAYER add COUNTRY varchar(70);`  
 It is a DDL command.

34. Differentiate between **CHAR** and **VARCHAR** datatype. Give example. 2

Ans: **CHAR**  
 Used to store strings of fixed size,  
 Can range in size from 1 to 8000 bytes,  
 Uses a fixed amount of storage, based on the size of the column,  
 Better performance

**VARCHAR**

Used to store strings of variable length  
 Can range in size from 1 to 8000 bytes  
 Use varying amounts of storage space based on the size of the string stored.  
 Slightly poorer performance because length has to be accounted for.

35. Write the SQL functions which will perform the following operations : 2  
(a) To display the name of the month of the current date.  
(b) To remove spaces from the beginning and end of a string "Panorama".

Ans: (a) Select monthname(now());  
(b) Select trim(" Panorama ");

36. What is the difference between a WHERE clause and a HAVING clause of SQL SELECT statement ? Give example. 2

Ans: **WHERE Clause** is used to filter the records from the table or used while joining more than one table. Only those records will be extracted who are satisfying the specified condition in WHERE clause. It can be used with SELECT, UPDATE, DELETE statements.

Example:

```
SELECT S_Name, Age FROM Student  
WHERE Age >=18
```

**HAVING Clause** is used to filter the records from the groups based on the given condition in the HAVING Clause. Those groups who will satisfy the given condition will appear in the final result. HAVING Clause can only be used with SELECT statement.

Example:

```
SELECT Age, COUNT(Roll_No) AS No_of_Students  
FROM Student GROUP BY Age  
HAVING COUNT(Roll_No) > 1
```

37. Difference between a Router and Gateway. Give example. 2

Ans: **Gateway**

To connect two networks of different protocols as a translator.

It connects two dissimilar networks.

It does not support dynamic Routing

**Router**

It ensures that data packets are switched to the right address with the best route.

It routes the data packets via similar networks

It supports dynamic Routing.

38. What are cookies ? What is their utility ? 2

Ans: A cookie is a piece of data from a website that is stored within a web browser that the website can retrieve at a later time. Cookies are used to tell the server that users have returned to a particular website.

Cookies also store information such as shopping cart contents, registration or login credentials, and user preferences.

39. Nivedita has recently shifted to a new city and new school .she does not know many people in her new city and school. But all of sudden, someone is posting negative, demeaning comments on her social network profile, school site's forum etc., She is also getting repeated mails from unknown people. Everytime she goes online, she finds someone chasing her online. 2

1) What is happening to Nivedita ?

2) What action should she take to stop them ?

- Ans: 1) Her account has been hacked by the the cyber criminals. She has become a victim of cyber bullying and cyber stalking.  
 2) She should immediately logout from her account, then tell her parents about it and inform the cyberpolice.

**Section-C**

40. Write a program in python to create a DataFrame using any method like list, dictionary. 3

	A	B	C	D
<b>Acct</b>	99	94.0	92	97.0
<b>Eco</b>	90	94.0	92	97.0
<b>Eng</b>	95	89.0	91	89.0
<b>IP</b>	94	NaN	99	95.0
<b>Math</b>	97	100.0	99	NaN

```
Ans: import pandas as pd
import numpy as np
Data={'A':[99,90,95,94,97], 'B':[94.0,94.0,89.0,np.NaN,100.0],'C':[92,92,91,99,99],
'D':[97.0,97.0,89.0,95.0,np.NaN]}
df=pd.DataFrame(Data,index=['Acct','Eco','Eng','IP','Math'])
df
```

41. Explain each of the following with illustrations using a table:  
 (a) Candidate Key (b) Primary Key (c) Foreign Key 3

Ans: Primary Key – is a column or group of columns in a table that uniquely identify every row in that table.  
 Candidate Key – is a set of attributes that uniquely identify tuples in a table. Candidate Key is a super key with no repeated attributes.  
 Foreign Key – is a column that creates a relationship between two tables. The purpose of Foreign keys is to maintain data integrity and allow navigation between two different instances of an entity.

**Table 1: Department**

DeptCode	DeptName
001	Science
002	English
005	Computer

**Table 2: Teacher**

Teacher ID	DeptCode	Fname	Lname
B002	002	David	Warner
B017	002	Sara	Joseph
B009	001	Mike	Brunton

In the table 1, deptcode is the primary and in table 2, it is the foreign key.

**Table 3 : Student**

StudID	Roll No	First Name	LastName	Email
1	11	Tom	Price	abc@gmail.com
2	12	Nick	Wright	xyz@gmail.com
3	13	Dana	Natan	mno@yahoo.com

In the above table 3 , StudID, RollNo and Email are Candidate keys . But we have selected StudId as primary Key.

42. Define MySQL function. Name the different types with example. 3

Ans On a broader category, there are two types of functions :-  
**Single Row functions** - Single row functions are the one who work on single row and return one output per row. For example, length and case conversion functions are single row functions.

**Multiple Row functions** - Multiple row functions work upon group of rows and return one result for the complete set of rows. They are also known as Group Functions.  
 Character /Non-numeric / String functions - Accepts character input and returns number or character value. Functions under the category are CONCAT, LENGTH, SUBSTR, INSTR, LPAD, RPAD, TRIM, UPPER, LOWER

43. Given an array **Rev** storing Revenue of a small business in past some years: 3  
 Rev= np.array([12, 15, 13, 15, 16, 17, 14, 19, 19, 17, 19, 16, 17, 16, 18, 18, 18, 19, 19, 18, 19,21, 20, 18, 19, 19, 21, 19, 19, 22])  
 (a) Write code to create a histogram as per following specifications:  
 ▪ Number of bins should be 10.  
 ▪ Plot color should be blue.  
 ▪ Outline/edge color should be red.  
 (b) Create a step type histogram.

Ans: import matplotlib.pyplot as plt  
 Rev= np.array([12, 15, 13, 15, 16, 17, 14, 19, 19, 17, 19, 16, 17, 16, 18, 18, 18, 19, 19, 18,19, 21, 20, 18, 19, 19, 21, 19, 19, 22])  
 (a) plt.hist(wt, bins=10, color ='b', edgecolor = 'r')  
 (b) plt.hist(wt,bins=10,histtype='step')

44. Consider the following table and answer the questions that follow: 3

**APPLICANTS**

NO	NAME	FEE	GENDER	CR_ID	DATEOFJOIN
1012	AMANDEEP	30000	M	A01	2012-01-02
1102	AVISHA	25000	F	A02	2009-03-24
1103	EKANT	30000	M	A03	2011-11-04
1049	ARUN	40000	M	A02	2009-05-06
1025	AMBER	30000	M	A01	2011-11-03

**COURSES**

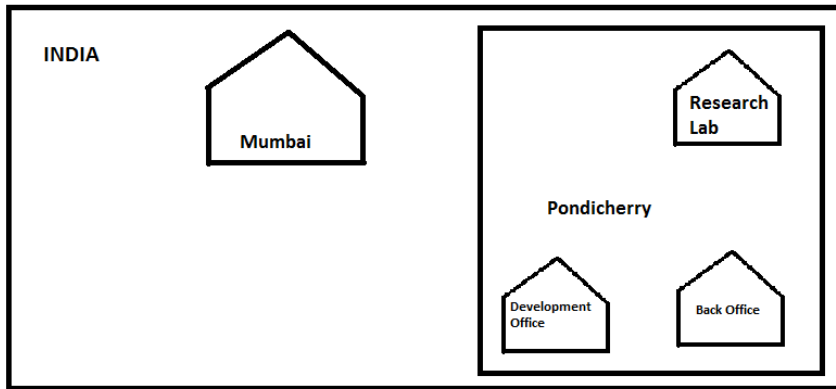
CR_ID	CNAME
A01	DATA MINING
A02	PROGRAMMING
A03	LATHING

- a) Identify the Primary Key and Foreign Key in APPLICANTS and COURSES table  
 b) What is the Cardinality and Degree of APPLICANTS table ?

Ans: (a) Applicants: Primary Key : NO Foreign Key : CR\_ID  
 Course : Primary Key : CR\_ID  
 (b) Cardinality : 5, Degree : 06

**Section-D**

45. "Bias methodologies" is planning to expand their network in India, starting with three cities in India to build infrastructure for research and development of the chemical products. The company has planned to set up their main office in Pondicherry - at three different locations and have named their offices as "Back office", "Research lab" and "Development unit". The company has one more research office namely "Corporate office" in Mumbai. A rough layout of the same is as follows 5



Approximate distance between these offices is as follows :

From	To	Distance
Research Lab	Back Office	110 metre
Research Lab	Development Unit	16 Km
Research Lab	Corporate Unit	1800 Km
Back office	Development Unit	13 Km

In continuation of the above, the company experts have planned to install the following number of computers in each of their offices:

Research Lab	158
Back office	79
Development Unit	90
Corporate Unit	51

(i) Suggest the kind of network required( out of LAN, MAN ,WAN) for connecting each of the following office units: Justify it.

-> Research lab and Back office

-> Research lab and Development unit

(ii) Which one of the following devices will you suggest for connecting all the computers in each of their office units ? Justify it.

-> Switch / hub

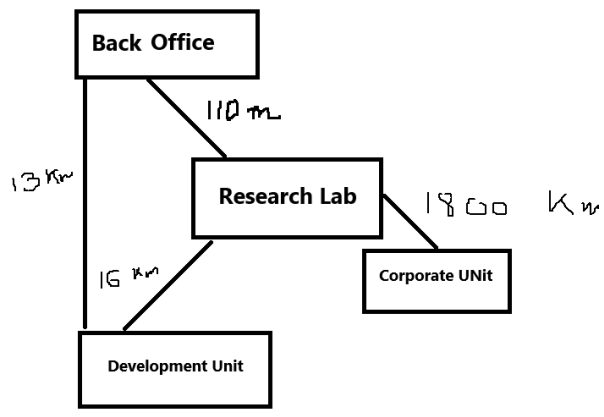
-> Modem

-> Telephone

(iii) Draw at-least two layouts and name the topology. Calculate the total distance or length of cable Required.

Ans: (i) LAN, MAN (ii) Switch / Hub  
(iii) Star topology or Tree topology





XXXXXXXXXXXXXXXXXXXXXXXXX END OF PAPER XXXXXXXXXXXXXXXXXXXXXXX