

## SAMPLE PAPER – 1

### SUBJECT: INFORMATICS PRACTICES

**SuperNova-LearnPython**, a YouTube channel dedicated to helping students to learn Python and computer science concepts.

The channel covers various topics related to computer science, including **Python programming, data file handling, computer networking, SQL** and many more.

If you're looking for video descriptions, notes, assignments, and previous years' question papers related to Python and computer science for class 11 and 12, I recommend checking out the **SuperNova-LearnPython** channel on YouTube.

[You can find the channel here<sup>1</sup>.](#)

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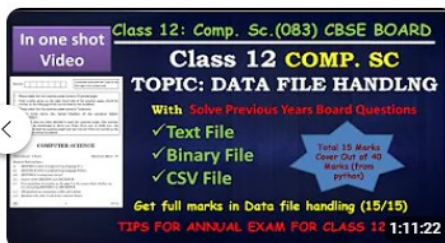
[learnpython4cbse.com](https://www.learnpython4cbse.com) and 2 more links

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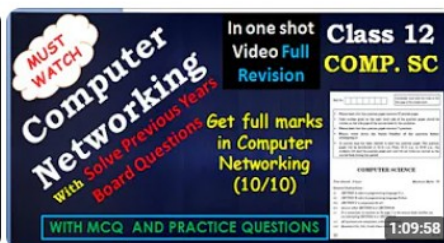
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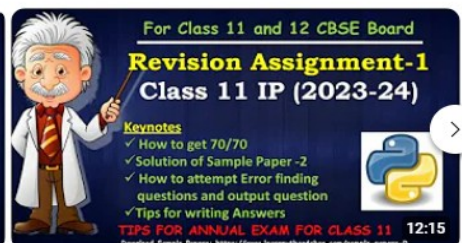
#### For You



Data file handling class 12 one shot | Data file Handling for class 12



One Shot Computer Networking with PYQs | cs class 12 | IP



Class 11 IP Revision Assignment - 1 | Class 11 Informatics Practices 2024

## SAMPLE PAPER – 1

Code: Learnpython4cbse-1/5(25CBSE01)

### INFORMATICS PRACTICES 12TH (CODE 065)

#### General Instructions:

**Time: 3 Hrs.**

**Max. Marks: 70**

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

#### SECTION A

**[21x1= 21]**

<b>1</b>	State whether the following statement is True or False: A Pandas Series can only contain numeric data types.	<b>1</b>
<b>2</b>	Name the function that is used to count the number of characters in a character expression. (a) LENGTH                      (b) COUNT                      (c) SUM                      (d) STRING	<b>1</b>
<b>3</b>	Which of the following devices amplifies signals to reach larger distances? (a) Modem                      (b) OFC                      (c) Repeater                      (d) HUB	<b>1</b>
<b>4</b>	Megha wants to display the current system date and time, which function she must use to get the correct output? (a) DATE()                      (b) TIME()                      (c) SYSDATE()                      (d) CURDATE()	<b>1</b>
<b>5</b>	Our digital footprint can be created by. (a) visiting any website                      (b) sending email                      (c) posting online                      (d) All of these	<b>1</b>
<b>6</b>	Which of the following method is used to concatenate two DataFrames df1 and df2 vertically? (a) pd.merge([df1, df2])                      (b) pd.append([df1, df2])	<b>1</b>

	(c) pd.concat([df1, df2])	(d) pd.join([df1, df2])	
<b>7</b>	Which of the following is incorrect regarding Data Visualisation? (a) Data visualization can be done using Matplotlib library. (b) Visualizing large and complex data does not produce effective results. (c) Data visualization is immensely useful in data analysis. (d) Decision makers use data visualization to understand business problem easily and build stages.		<b>1</b>
<b>8</b>	State whether the following statement is True or False: In SQL, NULL values can be used in mathematical operations like addition and multiplication.		<b>1</b>
<b>9</b>	To read a CSV file into a Pandas DataFrame while specifying that the first row of the file should be used as column headers, which parameter should be used in the pd.read_csv() function? (a) header=True                      (b) first_row=True                      (c) header=None                      (d) index_col=0		<b>1</b>
<b>10</b>	Which of the following is an example of active digital footprint? (a) Sharing personal information on Facebook, Instagram, etc. (b) Signing up when creating mail accounts. (c) Acceptance to install cookies when prompted to do so. (d) All of the above		<b>1</b>
<b>11</b>	Fill in the Blank: The _____ clause in SQL is used to filter records based on specific conditions. (a) ORDER BY (b) GROUP BY (c) WHERE      (d) HAVING		<b>1</b>
<b>12</b>	Collection of millions of interlinked web pages and resources on the internet forms the: (a) Web Server                      (b) Website                      (c) World Wide Web                      (d) E-mail System		<b>1</b>
<b>13</b>	The following code create a dataframe named 'DI' with columns. import pandas as pd DI = pd.DataFrame([1,2,3]) (a)1    (b) 2    (c) 3    (d)4		<b>1</b>
<b>14</b>	We should exhibit proper manners and etiquettes while being online. Choose the right netiquette(s). (a) Avoid cyber bullying                      (b) Respect other's privacy (c) No copyright violation                      (d) All of these		<b>1</b>
<b>15</b>	Rajan wanted to see all the values of a series school, which command(s) will do it ? (a) school[0:]                      (b) schoolj:]                      (c) school.all                      (d) Both (a) and (b)		<b>1</b>

**16** Match the following SQL functions/clauses with their descriptions:

SQL Function	Description
P. LOWER()	1. Returns the length of a String
Q. LENGTH()	2. Converts all characters in a string to lowercase.
R. UPPER()	3. Converts all characters in a string to uppercase.
S. TRIM()	4. Removes spaces from both sides of a string.

- (a) P-2, Q-1, R-4, S-3  
(c) P-2, Q-1, R-3, S-4

- (b) P-3, Q-4, R-1, S-2  
(d) P-4, Q-3, R-2, S-1

**1**

**17** Fill in the Blank:

The \_\_\_\_\_ operator in SQL is used to combine the results of two or more SELECT queries.

- (a) JOIN (b) UNION (c) INTERSECT (d) EXCEPT

**1**

**18** Select the correct statement to display horizontal box plot

- (a) plt.box(data,vert = False) (b) plt.boxfdata, horiz = True)  
(c) plt.boxplotfdata, vert = False) (d) plt.boxplotfdata, horiz = True)

**1**

**19** Which of the following is a characteristic of a peer-to-peer network?

- (a) Centralized server (b) Direct communication between devices  
(c) Data travels in a ring (d) Hierarchical structure

**1**

**Directions (Q. Nos. 20 and 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) pandas.head() is used to display first 5 records of any Series or DataFrame.  
Reason (R) It displays the last 3 rows.

**1**

**21** Assertion (A) In SQL, the ALTER TABLE statement can be used to delete a table from the database.  
Reason (R) The ALTER TABLE statement is used to modify the structure of a table, not delete it.

**1**

**SECTION B**

**[7x2= 14]**

**22** Write a program to create a series from a given Tuple  
data=(100,"Aavya Verma",96.3,"A").

**2**

**OR**

Carefully observe the following code:

```

import pandas as pd
Year1 = {'L1': 5000,'L2':8000,'L3':2000,'L4':18000}
Year2 = {'X':13000,'Y':14000,'Z':12000}
totSales = {1: Year1:2, Year2}
df= pd.DataFrame (totSales)
print(df)
    
```

Answer the following:

- (i) List the index of the DataFrame df
- (ii) List the column names of DataFrame df.

<b>23</b>	Define the following terms (a) Digital Footprints (b) Phishing	<b>2</b>
<b>24</b>	Mahesh, a database administrator needs to display house wise total number of records of 'Green' and 'Orange' house. She is encountering an error while executing the following query: SELECT HOUSE, COUNT (*) FROM STUDENT GROUP BY HOUSE WHERE HOUSE='Green' OR HOUSE= 'Orange'; Help her in identifying the reason of the error and write the correct query by suggesting the possible correction (s).	<b>2</b>
<b>25</b>	(A) Differentiate between web browser and web server. <p style="text-align: center;"><b>OR</b></p> (B) What is the role of a router as a network device?	<b>2</b>
<b>26</b>	Write the names of any four date/time functions and their uses.	<b>2</b>
<b>27</b>	Explain IPR (Intellectual Property Right)	<b>2</b>
<b>28</b>	(A) The Python code written below has syntactical errors. Rewrite the correct code and underline the corrections made. <pre> import pandas as pd data = {A [1,2, 3, 4, 5], B [6, 7, 8, 9, 10]} df = pd.DataFrame() result = df.loc[1:4. , 'A':, 'B']                     </pre>	<b>2</b>

**OR**

(B) Complete the given Python code: to create a DataFrame from the given dictionary 'data' and display the first 3 rows using Pandas.

```

Import _____ as pd
data = {'Name': ['John', 'Jane', 'Mike', 'Emily'], 'Age': [25, 30, 22, 28],
        'City': ['New York', 'London', 'Paris', 'Sydney']}
df = pd. _____ ( _____ )
print(df. _____ ( _____ ))
    
```

**SECTION C** **[4x3= 12]**

<b>29</b>	Simran often shares personal information and photos on various social networking sites. She is unaware of the potential risks associated with this behavior. <p>(i) What is a digital footprint, and how does it relate to Simran’s online activity?</p> <p>(ii) What are some potential risks of sharing too much personal information online?</p> <p>(iii) How can Simran protect her digital footprint?</p>	<b>3</b>
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<b>30</b>	(A) Write a Python code to create a DataFrame df using dictionary' of dictionaries from the data given below: <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 40%;">Name</th> <th style="width: 20%;">Class</th> <th style="width: 30%;">Marks</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Anamay</td> <td>XI</td> <td>95</td> </tr> <tr> <td>B</td> <td>Aditi</td> <td>XI</td> <td>82</td> </tr> <tr> <td>C</td> <td>Mehak</td> <td>XI</td> <td>65</td> </tr> <tr> <td>D</td> <td>Kriti</td> <td>XI</td> <td>45</td> </tr> </tbody> </table>		Name	Class	Marks	A	Anamay	XI	95	B	Aditi	XI	82	C	Mehak	XI	65	D	Kriti	XI	45	<b>3</b>
	Name	Class	Marks																			
A	Anamay	XI	95																			
B	Aditi	XI	82																			
C	Mehak	XI	65																			
D	Kriti	XI	45																			

**OR**

(B) Write the Python Program to a Pandas Series as shown below using a list. :-

Jammu	44
Srinagar	37
Delhi	46
Agra	48
Bangalore	32

<b>31</b>	I. Write an SQL statement to create a table named EMPLOYEES, with the following specifications: <ul style="list-style-type: none"> <li>EmployeeID (integer, primary key; auto-increment)</li> <li>FirstName (varchar, up to 50 characters)</li> <li>LastName (varchar, up to 50 characters)</li> </ul>	<b>3</b>
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- DateOfBirth (date)
- Salary' (decimal with 2 decimal places)

II. Write an SQL query to insert the following data into the EMPLOYEES table:

- 1, Ronit. Rawat, 1985-09-25, 55000.00

**32** (A) Given a table Drinks, write SQL queries to get the following:

**Table: Drinks**

DrinkID	Drinkname	Typo	Cost
D01	PepsiCola	Sot 11 )rinks	45
D02	CocaCola	SoftDrinks	40
D03	MineralWater	Gen	25
D04	SodaWatcr	Booster	30
D05	Mangodrink	Children	50

- Display the last 4 characters of the drinknames in uppercase.
- Display each drinkname and the cost increased to double using a function.
- Display the type and cost of the drinks whose drinkname has the word "cola" in it, using a mySQL function.

**OR**

(B) Write SQL commands for (i) to (iii) on the basis of table Student.

**Table : Student**

S.no	Name	Stream	Fees	Ago	Sex
1.	Arun Kumar	Computer	750.00	17	M
2.	Divyajaneja	Computer	750.00	18	F
3.	KesharMehra	Biology	500.00	16	M
4.	Harish Singh	Eng. Dr	350.00	18	M
5.	Prachi	Economics	300.00	19	F
6.	Nisha Arora	Computer	750.00	15	F
7.	Dinesh Kumar	Economics	300.00	16	M
8.	SarikaVaswani	Biology	500.00	15	F

- List the name of all students, who have taken stream as Computer.
- To count the number of female students.
- To display the number of students stream wise.

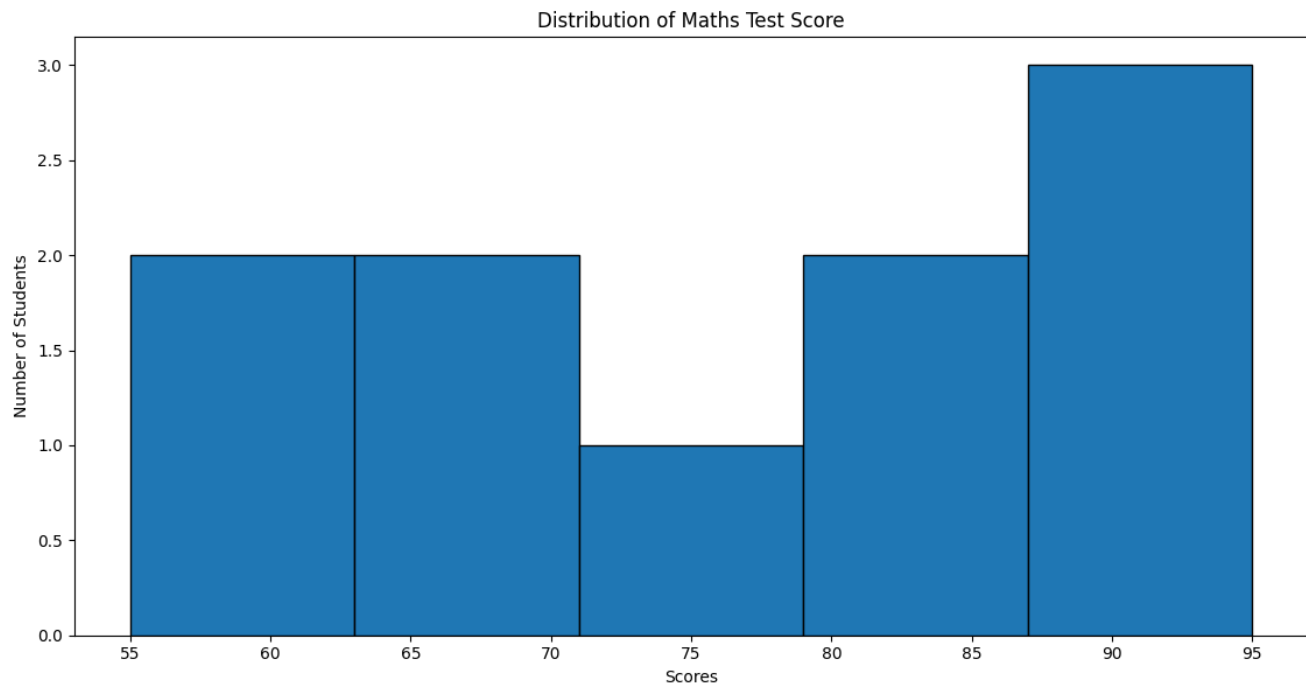
**SECTION D****[2x4= 8]**

**33** The scores obtained by students in a math test are as follows:

**4**

Scores – [55, 70, 85, 60, 90, 75, 80, 95, 65, 88]

Read the following code and fill in the blank with suitable Python code to generate a Histogram for the scores data. Add a title and labels for the X and Y axes. Save the histogram with the names\_scores\_histogram.png.



```
import matplotlib.pyplot as _____ #Statement-1
scores=[55,70,85,60,90,75,80,95,65,88]
plt.hist(_____,bins=5,edgecolor='black') #Statement-2
plt.title('Distribution of Maths Test Score') #Statement-3
plt.xlabel('Scores')
plt.ylabel('Number of Students')
plt._____('names_scores_histogram.png') #Statement-4
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. Refer the graph shown above and fill the blank in Statement-3 with suitable Chart Title.

IV. Fill in the blank in Statement-3 with suitable code.



- 34** Consider the following table FITNESS with details about fitness products being sold in the store. Write command of SQL for (i) to (iv).

**4****TABLE FITNESS**

P Code	P Name	Price	MANUFACTURER
P1	Treadmill	21000	Coscore
P2	Bike	20000	Aone
P3	Cross Trainer	14000	Reliable
P4	Multi G\m	34000	Coscore
P5	Massage Chair	5500	Regrosene
P6	Bellv Vibrator Belt	6500	Ambaway

- (i) To display the names of all the products with price more than 20000.  
(ii) To display the names of all products by the manufacturer Aone'.  
(iii) To change the price data of all the products by applying 25% discount reduction.  
(iv) To add a new row for product with the details: 'P7', 'Vibro Exerciser', 28000, Aone'.

**OR**

Consider the table PRODUCT given below. Write the output for (i) to (iv).

**TABLE PRODUCT**

No.	Product Name	Brand Name	Quality	Price
1.	Mixer Grinder	Maharaja	5	1250
2.	Washing Machine	Whirlpool	10	8500
3.	Microwave Oven	Phillips	6	8700
4.	Vacuum cleaner	Eureka Forbs	2	7400
5.	Dish washer	Maharaja	5	12500

- (i) SELECT AVG(Price) FROM PRODUCT WHERE BrandName= 'Maharaja';  
(ii) SELECT COUNT (DIST INCT BrandName) FROM PRODUCT;  
(iii) SELECT MAX(Price) FROM PRODUCT;  
(iv) SELECT ProductName FROM PRODUCT WHERE Quantity > = 10;

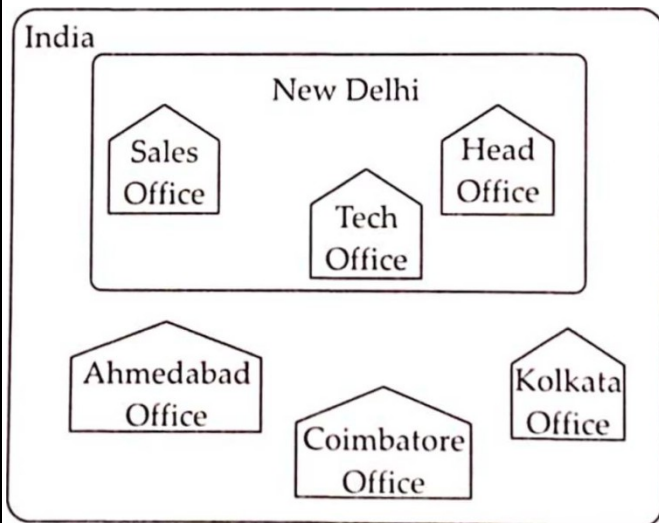
**SECTION E****[3x5= 15]**

- 35** Hindustan Connecting World Association is planning to start their offices in four major cities in India to provide regional IT infrastructure support in the field of education and culture. The company has planned to setup their head office in New Delhi in three different locations and have

**5**

named their New Delhi offices as Sales Office, Head Office and Tech Office. The company's regional offices are located at Coimbatore, Kolkata and Ahmedabad.

A rough layout of the same is as follows:



Approximate distances between these offices as per network survey team is as follows

Place from	Place to	Distance
Head Office	Sales Office	10 m
Head Office	Tech Office	70 m
Head Office	Kolkata Office	1291 m
1 lead Office	Ahmedabad Office	790 m
Head Office	Coimbatore Office	1952 m

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

Head Office	100	Sales Office	20
Tech Office	50	Kolkata Office	50
Ahmedabad Office	50	Coimbatore Office	50

Answer the following questions:

(i) Suggest the network type (out of LAN, MAN, WAN) for connecting each of the following set of their offices.

- (a) Head Office and Tech Office
- (b) Head Office and Coimbatore Office

(ii) Which device will you suggest to be procured by the company for connecting all computers within each of their offices out of the following devices?

- (a) Modem
- (b) Telephone
- (c) Switch/Hub

(iii) Suggest the cable/wiring layout for connecting the company's local offices located in New Delhi.

(iv) Suggest a device/software and its placement that would provide data security for the entire network.

(v) Suggest a device and the protocol that shall be needed to provide wireless Internet access to all smartphone/laptop users.

**36** Given a dataframe SALES storing sale of fruits in Kilograms as shown below:

**5**

	Apples	Grapes	Banana	Guava
Jammu	240	25	123	94
Reasi	76	68	98	57
Udhampur	164	114	95	125
Srinagar	375	180	95	115

Assuming that the dataframe SALES is available, write code to do the following: -

- (i) Total Sale for each city.
- (ii) Print details of the city with maximum sale of Guava.
- (iii) Total sale for each Fruit type.
- (iv) To find the city with the minimum sale of Banana.
- (v) To calculate the average sale for each fruit type.

**37** Write suitable SQL query for the following:

**5**

- (i) Display 7 characters extracted from 8th left character onwards from the string 'SHINING WORLD'.
- (ii) Display the position of occurrence of string 'Web' in the string "Dynamic Website".
- (iii) Round off the value 77.78 to one decimal place.
- (iv) Display the remainder of 102 divided by 9.
- (v) Remove all the expected leading and trailing spaces from a column EMP1D of the table "EMP?"

**OR**

Explain the following SQL functions using suitable examples.

- (i) UCASE()
- (ii) RTRIM()
- (iii) MID()
- (iv) INSTRQ
- (v) MOD()