SAMPLE PAPER – 3
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 and Informatics Practices including ***Python programming, data file handling, computer networking***, ***SQL, DataFrame, Series, Data Visualization using pyplot*** 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](1).

Happy learning! .

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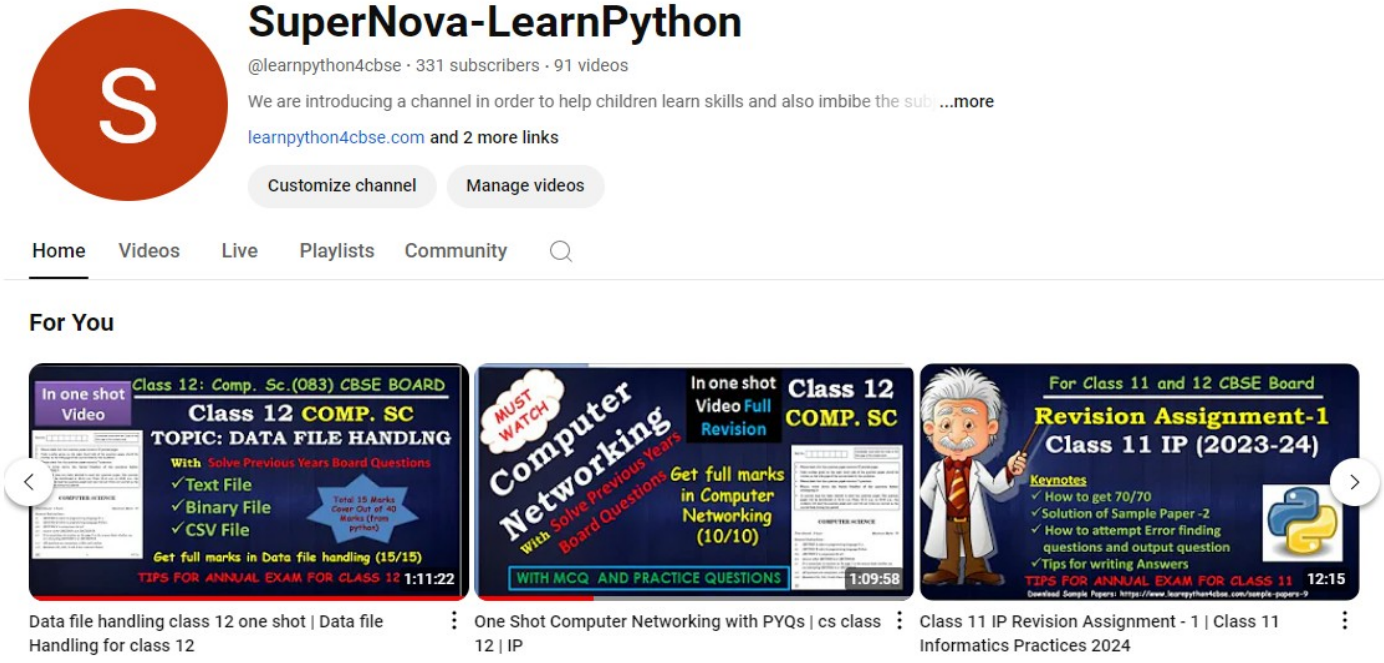


SAMPLE PAPER – 3

Code:Learnpython4cbse-3/5(25cbse03)

INFORMATICS PRACTICES (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]**

1 State whether the following statement is True and False: **1**

The loc function in pandas is used to access rows by their integer position.

2 Which SQL command clause helps to arrange records in ascending or descending order. **1**

(a) Having (b) Order by

(c) Group by (d) Arrange

3 This topology provides easier detection of errors: **1**

(a) Star (b) Bus

(c) Tree (d) Mesh

4 Which of the following function returns an integer that indicates the position of the first occurrence of the sub-string within the string? **1**

(a) INSTR() (b) RTRIM()

(c) LENGTH) (d) TRIM()

5 Which of the following is/are the benefit(s) of e-Waste management? **1**

(a) Saving the environment (b) Creating jobs

(c) Recovery of precious metals (d) All of these

6 While accessing the column from the dataframe, we can specify the column name. In case column does not exist, which type of error it will raise? **1**

(a) Key error (b) Syntax error

(c) Namne error (d) Runtime error

7 What is the purpose of the subplot() function in Matplotlib? **1**

(a) Create multiple plots in one figure (b) Set the subplot title

(c) Add subplots to a figure (d) Adjust subplot spacing

8 State whether the following statement is True and False: **1**

The SQL UPDATE statement can be used to modify existing records in a table.

9 Which function will be used to read data from a CSV file onto Pandas dataframe? **1**

(a) readcsv() (b) to _csv()

(c) read_csv() (d) csv_read()

10 The Indian IT act was framed in the year : **1**

(a) 2001 (b) 2000

(c) 2002 (d) 1999

11 Fill in the blank: **1**

The SQL command used to remove a table from the database is_____

(a) DELETE (b) REMOVE

(c) DROP (d) TRUNCATE

12 What kind of transmission medium is most appropriate to carry data in a computer network that is exposed to electrical interferences? **1**

(a) Unshielded twisted pair (b) Optical fiber

(c) Coaxial cable (d) Microwave

13 Function to display the first n rows in the DataFrame is **1**

(a) tail() (b) head()

(c) top() (d) first()

14 What is a common health concern associated with prolonged use of digital devices such as smartphones and computers? **1**

(a) Increased physical fitness (b) Enhanced mental clarity

(c) Eye strain and vision problems (d) Improved posture

15 Which function is used to sort the series values using values? **1**

(a) sort() (b) values()

(c) sort_values() (d) values_sort()

16 Match the following SQL functions/clauses with their descriptions: **1**

SQL Function	Description
P. MAX)	1. Removes duplicate rows from the result set.
Q. AVG()	2. Returns the maximum value in a column.
R. INSTR()	3. Find the position of a substring in a string.
S. DISTINCT	4. Returns the average value in a column.

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

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

17 Fill in the blank: **1**

The _____method is used to concatenate two DataFrames along a specific axis.

(a) merge() (b) append()

(c) concat() (d) join()

18 When using the plt.subplots() function, which paranmeter allows you to specify the size of the figure in inches? **1**

(a) figsize (b) size

(c) dimensions (d) width, height

19 Identify the device which connect dissimilar networks? **1**

(a) Router (b) Gateway Directions

(c) Modem (d) Both (a) and (b)

(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) Two series can be added in pandas, if the indexes are same. **1**

Reason (R) Indexes in pandas series can be changed by the index property.

21 Assertion (A) The GRANT command in SQL is used to provide users with privileges to perform actions on the database. **1**

Reason (R) The 'GRANT command is a Data Manipulation Language (DML) Command.

SECTION B **[7x2= 14]**

22 What is the purpose of the tail() function in Parndas? Provide an example. **2**

OR

Explain the head() function in Pandas with an example.

23 What is phishing and how can it be avoided? **2**

24 Consider the string: "Entity Relationship Diagram". Write suitable SQL queries for the following: **2**

I. To extract and display "Entity" from the string.

II. Display the position of the first occurrence of "Relationship" in the given string.

25 Aman, a freelance website developer, has been assigned a task to design few web pages for a book shop. Help Aman in deciding out of static web page and dynamic web page, what kind of web pages should be designed by clearly differentiating between static and dynamic web pages on atleast two points? **2**

OR

Priyanka, a beginner in IT field has just started learning web technologies. Help her in understanding the difference between website and web pages.

26 Write any two differences between Insert and Update commands of SQL. **2**

27 What is the importance of Net Etiquettes? **2**

28 Python code written below has syntactical errors. Rewrite the correct code and underline the corrections made. **2**

```
Import pandas as pd
data = {'Name' : ['Riya', 'Preeti', 'Neeta']. 'Age': [25, 30, 22])
df = Pd.DataFrame(Data)
df.to_csv('output.csv')
```

OR

Complete the given Python code: Given a DataFrame 'df, select rows where the 'score' column is greater than 80 and 'age' column is less than 30.

```
import _____as pd
df =_____.DataFrame({'name': [ 'Riya', 'Preeti'. 'Neeta'],
                     'age': [25, 30, 22], score': [85, 78, 92]})
selected_rows = df[(df[_____] > 80) & (df['age'] < _____)]
print (selected_rows)
```

SECTION C **[3x4= 12]**

29 Saharsh is a student of Class IXth and he is a very frequent user of Internet applications. One day he got an unpleasant message on his instant messenger. **3**

(i) What do you think he should do?

(ii) Exhibiting proper manners and etiquettes while being online is called as?

(iii) Name the law to handle such issues?

30 Ritika is a new learner for the Python Pandas and she is aware of some concepts of Python but is unable to create the Datarrame. Help her by writing proper statement which will create the DataFrame for the following data. **3**

Name: [Manpreet','Kavil','Manu','Ria']

Phy:[70,60,76,89]

Chem:[30,70,50,65]

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.

Dhola Sadiya Bridge	Assam
Dibang River Bridge	Arunachal Pradesh
Mahatma Gandhi Setu	Bihar
Munger Ganga Bridge	Uttar Pradesh

31 I. Write an SQL statement to create a table named **CUSTOMER**, with the following specifications: **3**

Column Name	**Data Type**	**Key**
CustomerID	Numeric	Primary Key
FirstName	Varchar(30)	
LastName	Varchar(30)	
DOA	Date	
Email	Varchar(50)	

II. Write an SQLQuery to insert the following data into the CUSTOMER table: 5678, John, Doe, 20-Jan-2022, john.doe@example.com

32 Consider the following tables: **3**

Table 1: CUSTOMER, which stores CustomerID, CustomerName, and CustomerCountry.

Table 2: ORDERS, which stores OrderID, CustomerID, OrderDate, and OrderAmount.

Table: CUSTOMER

CustomerID	CustomerName	CustomerCountry
1	Alice	USA
2	Bob	Canada
3	Charlie	USA
4	Diana	UK
5	Edward	Canada

Table: ORDERS

OrderID	**CustomerID**	**OrderDate**	**OrderAmount**
101	1	2024-09-01	500
102	2	2024-09-02	300
103	3	2024-09-03	450
104	4	2024-09-04	700
105	5	2024-09-05	350

Write appropriate SQL queries for the following:

I. Display the total order amount per count ry.

II. List all customers who have placed orders in descending order of their total order amount.

III. Display customer names along with the order date and order amount for each order.

OR

Consider the following tables:

Table 1: STUDENT which stores Student ID (STUDENT_ID), Student Name (STUDENT_NAME), and Student Age (AGE).

Table 2: ENROLLMENT which stoves Student ID (STUDENTJD), Course ID (COURSE_1D), and Grade (GRADE) for various students.

Table 1: STUDENT

STUDENT_ID	STUDENT_NAME	AGE
1	Alice	20
2	Bob	21
3	Charlie	22
4	David	20
5	Emma	23

Table 2: ENROLLMENT

STUDENT_ID	COURSE_ID	GRADE
1	101	A
2	101	B
3	102	A
4	103	C
5	102	B

Write appropriate SQL queries for the following:

I. Display the average age of students who are enrolled in course ID 101.

II. List all courses in the decreasing order of the number of students enrolled.

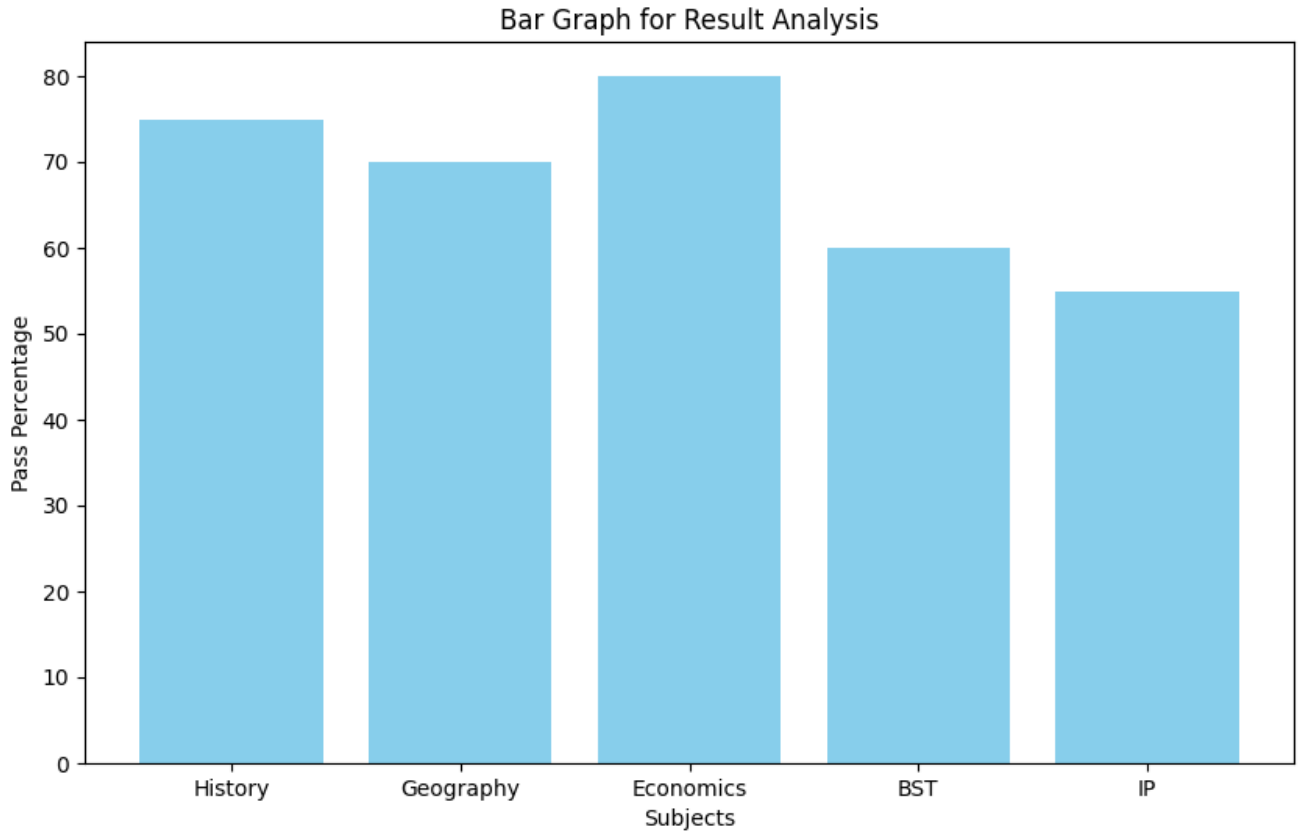
III. Display the names of students along with their grades in course ID 102.

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

33 A Student during an exam has to fill the blanks in a Python code that generate the bar chart. This bar chart represents the pass percentage of five subjects. Consider a plot bar chart for Result Analysis as shown below: **4**

Subject	Pass_Percentage
History	75
Geography	70
Economics	80
BST	60
IP	55

Help the student to complete the code




```
import _____ as plt #Statement-1
subjects=['History', 'Geography', 'Economics', 'BST', 'IP']
pass_percentage=[75, 70, 80, 60, 55]
plt._____(figsize=(10, 6))#Statement-2
plt.bar(subjects, pass_percentage, color='skyblue')
plt._____('Bar Graph for Result Analysis')#Statement-3
plt.xlabel('Subjects')
plt._____("Pass Percentage")#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 State.ment-3 with suitable Chart Title.

IV. Fill in the blank in Statement-4 with the name of the function to set the label on the y-axis.

34 **Table : Worker** **4**

Ecode	Name	Desig	Plevel	DOJ	DOB
11	Radhcy Sliyam	Supervisor	P00I	13-Sep-2004	23-Aug-1981
12	Chander Nath	Operator	P003	22-Feb-2010	12-Jul-1987
13	Fizza	Operator	P003	14-June-2009	14-Oct-1983
15	Ameer Ahmed	Mechanic	P002	21-Aug-2006	13-Mar-1984
18	Sanya	Clerk	P002	19-Dec-2005	09-J line-1983

Consider the above table and write the SQL commands for the following:

(i) To display the details of all workers in descending order of DOB.

(ii) To display Name and Desig of those workers, whose Plevel is either P001 or P002.

(iii) To display the detail of all the workers, whose DOB is in between '19-JAN-1984 and '18-JAN-1987'.

(iv) To add a new row with the following data:
19, 'Daya kishore', 'Operator', 'P003', '19-Jun-2008', 'll-Jul-1984

OR

Table Furniture

No	Itemname	Type	Dateofstock	Price	Discount
1	White lotus	Double Bed	23/02/02	30000	25
2	Pink leather	Baby Cot	20/01/02	7000	20
3	Dolphin	Baby Cot	19/02/02	9500	20
4	Decent	Office Table	01/01/02	25000	30
5	Comfort Zone	Double Bed	12/01/02	25000	25

Based on above table, write the SQL commands for the following:

(i) To show all information about the baby cots from the Furniture table.

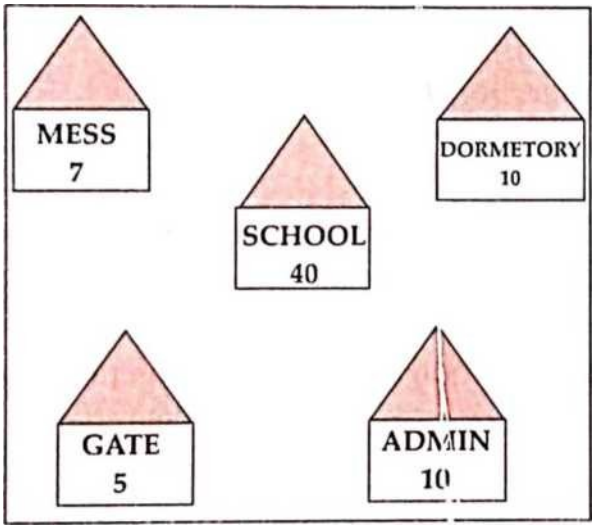
(ii) To list the Itemname which are priced at more than 15000 from the Furniture table.

(iii) To list Itemname and Type of those items, in which Dateofstock is before 22/01/02 from the Furniture table in the descending order of Itemname.

(iv)To display Itemname and Dateofstock of those items, whose Type is "Sofa" from Furniture table

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

35 JNV School at Hyderabad has their offices according to the following diagram. Go through the details and answer the questions that follows: **5**



Distance between various wings are given below:

Wings	Distance (in metre)
MESS to SCHOOL	60
MESS to DORMETORY	110
MESS to GATE	65
MESS to ADMIN	130
SCHOOL to DORMETORY	40
SCHOOL to GATE	50
SCHOOL to ADMIN	68
DORMETORY to GATE	115
DORMETORY to ADMIN	100
GATE to ADMIN	65

(i) Name the most suitable wing, where the server should be installed. Justify your answer.

(ii) Draw the cable layout to efficiently connect various wings JNV, Hyderabad and a write the topology.

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

(iv) (a) Which device will you suggest to be placed/installed in each of these wings to efficiently. Connect all the computers within these wings.

(b) Suggest the placement of a repeater in the network with justification.

(v) Suggest a device and the protocol that shall be needed to provide wireless Internet access to all smart phone/laptop users in the campus of JNV, Hyderabad.

36 Consider the given DataFrame **'Stock'**: **5**

	Name	Price
0	Item1	150
1	Item2	180
2	Item3	225
3	Item4	500

(i) Add a column called Special_Price with the following data: [135, 150, 200, 440].

(ii) Add a new book named The Secret' having price 800.

(iii) Remove the column Special_Price.

(iv) Update the price of 'Item2' to 190.

(v) Filter the DataFrame to show only items with a price greater than 200.

37 Write suitable SQL query for the following: **5**

(i) To display the minimum value from the price column (attribute) in the Products table.

(ii) To display the first five characters of the phone_number column (attribute) in the Contacts table. (Note: The hone numbers are stored in the format +91-989-436-7090)

(iii) To display the data from the column (attribute) email in the Customers table, after eliminating any leading and trailing spaces.

(iv) To display the average value in the age column (attribute) of the Members table.

(v) To determine the count of distinct values in the category column (attribute) of the Items table.

OR

Write SQL queries:

(i) To display the name of the month for the current date.

(ii) To display the leftmost 5 characters from the string "INFORMATICS PRACTICES".

(iii) To display the position of the first occurrence of "iya" in the string "Kendriya Vidyalaya".

(iv) To display the column NAME in uppercase from table STUDENT.

(v) To compute the remainder of 120 and 7 using SQL function.