CBSE Class 12 Informatics Practices 2021 - Set 4 (Code 90) - Compartment

Question Paper

Conducted by the Central Board of Secondary Education (CBSE)

Time Allowed: 3 Hours **Maximum Marks: 70**

General Instructions

(i) This question paper contains two parts - Part A and Part B. Each part is compulsory.

(ii) Both Part A and Part B have choices.

(iii) Part A Section I has short answer questions to be answered in one word or one line. Attempt any 15 questions from questions 1-21.

(iv) Part A Section II has two compulsory case study questions. Each case study has 5 case-based subparts. Attempt any 4 of the 5 subparts from each question. Each subpart carries 1 mark.

(v) Part B is a descriptive paper with three sections.

(vi) Part B Section I has short answer questions of 2 marks each, in which two questions have internal options.

(vii) Part B Section II has long answer questions of 3 marks each, in which two questions have internal options.

(viii) Part B Section III has very long answer questions of 5 marks each, in which one question has an internal option.

Part A Section I

1. You were not able to create the IP project, therefore you downloaded a project from the internet and submitted it to your teacher by your name. This wrong/unethical act is considered as _____ .

(A) Copyright (B) Hacking

(C) Plagiarism (D) Trademark

2. Which Python package is used for 2D graphics ?

(A)

```
matplotlib.pyplot
```

(B)

```
pyplot.lib
```

(C)

```
matplotlib.py
```

(D)

```
matplotlib.plt
```

3. Write the output of the following SQL command :

```
select round(3456.885, 2);
```

(A) 3456.88 (B) 3456.89

(C) 3400 (D) 3500

4. What will be the output of the following program ?

```
import pandas as pd
x=6
S1=pd.Series(x,index=[1,2,4,6,8,9])
print(S1)
```

(A)

1	6
2	6
4	6
6	6
8	6
9	6

dtype: int64

(B)

0	6

dtype: int64

(C)

1	2	4	6	8	9
6	6	6	6	6	6

dtype: int64

(D) None of the above

5. Which one of the following is an attribute of the series in Pandas to set the index label for the given object ?

(A) `label` (B) `index`

(C) `loc` (D) All of the above

6. Using Python Matplotlib _____ can be used to display information as a series of data points.

(A) line chart (B) bar graph

(C) histogram (D) None of the above

7. Which of the following topologies needs least cable length ?

(A) Star (B) Tree

(C) Bus (D) None of the above

8. Out of the following, which crime(s) will come under cyber crime category ?

(A) Identity theft (B) Invasion of privacy

(C) Online harassment (D) All of the above

9. An aggregate function performs a calculation on _____ and returns a single value.

(A) single value (B) multiple values

(C) no value (D) None of the above

10. Which of the following is a web browser ?

(A) Microsoft Windows (B) Android

(C) Microsoft Edge (D) Ubuntu

11. Which one of the following would arrange the rows in ascending order in SQL ?

(A) `SORT BY` (B) `ALIGN BY`

(C) `GROUP BY` (D) `ORDER BY`

12. Technology not protected by copyright and available to everyone, is categorized as:

(A) Proprietary (B) Open Source

(C) Experimental (D) Shareware

13. What will be the output of the Python program ?

```
import pandas as pd
I=['Apple','Banana','Mango','Orange','Litchi']
df=pd.DataFrame(I,index=[1,2,3,4,5])
print(df.iloc[1:3])
```

14. Indian law to deal with cyber crime is :

(A) Cyber Act (CA) (B) Internet Act (IA)

(C) IT Act (ITA) (D) WWW Act (WWWA)

15. A _____ is a collection of interconnected _____ designed with a goal in mind.

(A) webpage, website (B) web browser, webpage

(C) server, client (D) website, webpage

16. In the _____ field of the e-mail, enter the recipients whose address you want to hide from other recipients.

(A) Carbon Copy (B) To

(C) Blind Carbon Copy (D) All of the above

17. E-waste is harmful to the environment and human health if not properly treated or disposed of, therefore they must be handled with care. What are the health hazards which can be caused by E-waste ?

(A) Lung cancer (B) DNA damage

(C) Brain damage (D) All of the above

18. The _____ command can be used to select an existing database in SQL.

19. The SQL string function that returns the index of the first occurrence of substring is _____ .

20. What is the type of network for long distance communication ?

(A) LAN (B) MAN

(C) WAN (D) PAN

21. _____ helps to enhance the functionality of the web browsers.

(A) Extension (B) Plugin

(C) Add-on (D) All of the above

Part A Section II

22. Consider the following DataFarme df and answer any **four** questions from (i) to (v) :

```
import pandas as pd
t={'rollno':[1,2,3,4,5,6],
'Name':['Krishna','Pranshu','Gurusha','Arpit','Rani','Aurobindo'],
'Age':[15,14,14,15,16,15],
'marks':[70.4,60.9,80.3,87.5,67.8,86.0],
'class':['11A','12B','11B','12B','12B','11B']
}
df = pd.DataFrame(t,index=[10,20,30,40,50,60])
```

22(i). Write down the command that will give the following output :

rollno	2
Name	Pranshu
Age	14
Marks	60.9
Class	12B

Name: 20, dtype: object

(A)

```
print(df.iloc[1])
```

(B)

```
print(df.loc[1])
```

(C)

```
print(df.LOC[1])
```

(D)

```
print(df.iloc(1))
```

22(ii). The teacher wants to know the highest marks secured by the students. Which statement would help her to get the correct answer ?

(A)

```
print(df[marks].max())
```

(B)

```
print(df.max([marks]))
```

(C)

```
print(df['marks'].max())
```

(D)

```
print(df('marks').max)
```

22(iii). Which of the following statement(s) will add new column 'fee' as third column with values [3200,3400,4500,3100,3200,4000] in DataFrame df ?

(A)

```
df.insert(loc=2,column='fee',
    value=[3200,3400,4500,3100,
    3200,4000])
```

(B)

```
df.add(2,column='fee',[3200,3400,
    4500,3100,3200,4000])
```

(C)

```
df.append(loc=2,'fee'=[3200,3400,
    4500,3100,3200,4000])
```

(D)

```
df.insert(loc=2,'fee'=[3200,3400,
    4500,3100,3200,4000])
```

22(iv). Which of the following commands is useds to remove the column 'Age' in the DataFrame df ?

(A)

```
df.drop('Age',axis=1,inplace=True)
```

(B)

```
df.drop('Age',axis=0,inplace=True)
```

(C)

```
df.drop['Age',axis=1,inplace=True]
```

(D)

```
df.delete('Age',axis=1,
    inplace=True)
```

22(v). Which of the following command would rename the column 'marks' to 'Term1' in the DataFrame df ?

(A)

```
df.rename(['marks','Term1'],
    inplace=True)
```

(B)

```
df.rename({'marks':'Term1'},
    inplace=True)
```

(C)

```
df.rename(columns={'marks':'Term1'},
    inplace=True)
```

(D)

```
df.rename(['marks':'Term1'],
    inplace=True)
```

23. Consider the table HOTEL given below and write any four SQL commands :

Table : HOTEL

Hotel_Id	H_Name	Location
H001	The Palace	Delhi
H002	The Resort	Mumbai
H003	Adobe Resort	Dubai
H004	Victoria Hill	London
H005	The Bee	London

Hotel_Id	Room_type	Price
H001	Deluxe	4500
H002	Deluxe	8000
H003	Villa	2750
H004	Duplex	10000
H005	Villa	30000

Hotel_Id	Star
H001	5
H002	7
H003	7
H004	3
H005	7

23(i). Display the details of all the Hotels situated in London.

23(ii). Display the details of all 'Deluxe' rooms with price more than 6000 in ascending order of Price.

23(iii). Display the Hotel names that end with "e".

23(iv). Count different types of rooms available in the Hotels.

23(v). Display the Hotel names in descending order.

Part B Section I

24. Write a program in Python to create the series of all the alphabets of "Happy" with default index. Print the first three alphabets.

25(a). Raunak wanted to display the list of employees who did not get commission. Therefore, he wrote the following query in SQL :

```
SELECT emp_name from emp where comm=NULL;
```

He did not get the correct answer. Identify the error and write the correct SQL statement.

OR

25(b). Can we use Where clause after Group By clause ? Name the clause which is used to restrict the number of records returned by the Group By clause.

26. Discuss the purpose of count(*) function with the help of a suitable example.

27. Consider the following two series 'A' and 'B' :

```
A=pd.Series([2,4,6], index=[0,1,2])
B=pd.Series([1,3,5], index=[1,2,3])
```

(i) Write the statement to add both the series 'A' and 'B'.

(ii) Write the statement to multiply two series 'A' and 'B'.

28. Write the output (i and ii) for the following SQL commands :

Table: F_INDIA

F_ID	Product	Price	Qty
F01	Sun Cream	678	10
F02	Beauty Cream	5400	15
F03	Face Glow Foundation	1704	20
F04	Gel Wax	520	10
F05	Hair Shampoo	800	25
F06	Beauty Cream	1200	32

```
(i)  SELECT COUNT (Distinct product) FROM F_INDIA;
(ii) SELECT Product, Price FROM F_INDIA WHERE Product LIKE '%m';
```

29(a). Find the output of the following SQL queries :

```
(i)  SELECT SUBSTR ("Innovation",3,4);
(ii) SELECT RIGHT ("Innovation",5);
```

OR

29(b). Find the output of the following SQL queries :

```
(i)  SELECT INSTR ("COVID-19", "v");
(ii) SELECT MOD(5,2);
```

30. Consider the following DataFrame 'stu' :

	Admno	Firstname
0	1001	Amit
1	1002	Rohit
2	1003	Shyam
3	1004	Manan
4	1005	Raman

	Lastname	Age
0	Sehgal	18
1	Malik	17
2	Bhatia	18
3	Gupta	16
4	Bajaj	18

	Pretest	Posttest
0	87	67
1	89	78
2	90	84
3	79	69
4	92	70

Write the statements for the DataFrame "stu" :

(i) Display the details of the students in the reverse order of their indexes.

(ii) Add a new row in the DataFrame "stu" with values (1006,Sujal,Sharma,17,87,89).

31. What do you understand by the term VoIP ? Give two examples of software/apps based on VoIP.

32. Nowadays children are fond of playing computer games. What is the health hazard that can occur due to excessive use of computer/smart phone screens ?

33. Expand URL. Explain URL with the help of an example.

Part B Section II

34. Create a series S1 with the values (2,3,1).

Find the output of the following two statements considering the above created series :

(a) print(S1**3)

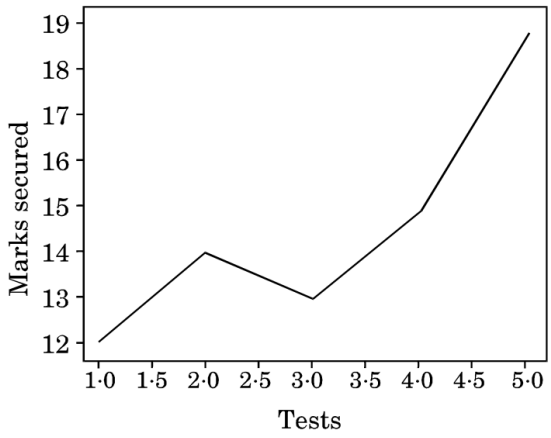
(b) print(S1*3)

35(a). What is the difference between Copyright and Licenses ?

OR

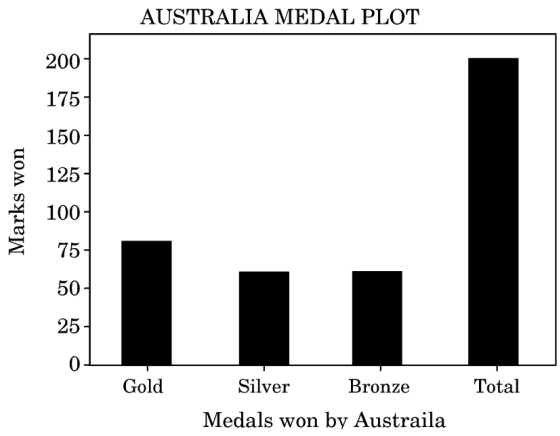
35(b). What do you understand by Intellectual Property Rights ? Why is there a need to protect Intellectual Property Rights ?

36(a). Consider the following graph. Write the code to plot it. Also label the X and Y axis.



OR

36(b). Write code to draw the following bar graph representing the total number of medals won by Australia.



36(a)-VI. For visually impaired students only, in lieu of question 36:

What is Data Visualization ? Discuss briefly. Also mention the name of one of the most commonly used Python library for data visualization.

OR

36(b)-VI. For visually impaired students only, in lieu of question 36:

Mention the purpose of the following functions briefly :

(i) plot()

(ii) show()

(iii) savefig()

37. Consider the following table **School** :

Table : **School**

Admno	Name	Class
20150001	Abhishek Kumar	10
20140212	Mohit Bhardwaj	11
20090234	Ramandeep Kaur	10
20130216	Mukesh Sharma	9
20190227	Rahil Arora	10
20120200	Swapnil Bhatt	11

Admno	House	Percentage
20150001	Green	86
20140212	Red	75
20090234	Yellow	84
20130216	Red	91
20190227	Blue	70
20120200	Red	64

Admno	Gender
20150001	Male
20140212	Male
20090234	Female
20130216	Male
20190227	Male
20120200	Female

Write SQL queries for the following :

(a) Display the total number of students in each House where number of students are more than 2.

(b) Display the average Percentage of girls and boys.

(c) Display the minimum Percentage secured by the students of Class 10.

Part B Section III

38. (a) Write a program in Python Pandas to create the following DataFrame "population" from a Dictionary :

	country	population	percent
IT	Italy	61	0.83
ES	Spain	46	0.63
GR	Greece	11	0.15
FR	France	65	0.88
PO	Portugal	10	0.14

(b) Perform the following operations on the DataFrame:

(i) Display the columns country and population.

(ii) Display all the rows where population is more than 40.

(iii) Delete the last 2 rows.

39(a). Write the SQL functions which will perform the following operations :

(i) To display the name of the weekday for your date of birth

(ii) To convert e-mail-id to lowercase

(iii) To count the number of characters in your name

(iv) To display the first character of your name

(v) To calculate the average marks secured by the class

OR

39(b). Consider a table ITEM with the following data :

S.No.	Itemname	Type
1	Eating Paradise	Dining Table
2	Royal Tiger	Sofa
3	Decent	Office Table
4	Pink Feather	Baby Cot
5	White Lotus	Double Bed

S.No.	Stockdate	Price
1	19-02-2002	11500.58
2	22-02-2002	31000.67
3	01-01-2002	25000.623
4	20-01-2001	7000.3
5	23-02-2002	NULL

S.No.	Discount
1	25
2	30
3	30
4	20
5	25

Write SQL queries using SQL functions to perform the following operations :

(i) Display the first 3 characters of the Itemname.

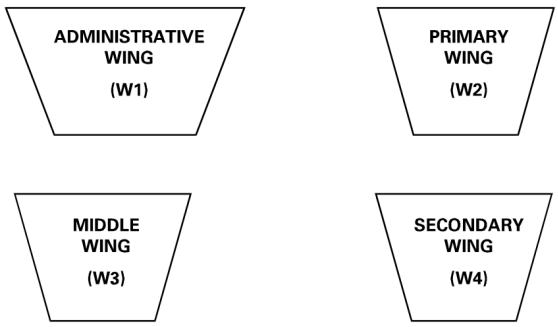
(ii) Display the month name from the Stockdate.

(iii) Display the total price of the whole stock.

(iv) Display the average Price of all the stocks.

(v) Display all the Price round off up to 2 decimal places.

40.



ABC International School, Delhi has different wings as shown in the diagram :

Distance between the wings are as follows :

W3 to W1	70 m
W1 to W2	40 m
W2 to W4	15 m
W4 to W3	100 m
W3 to W2	120 m
W1 to W4	80 m

Number of computers in each of the wings :

40. (continued)

W1	125
W2	40
W3	42
W4	60

Based on the above information, answer the following questions :

(a) Suggest the most suitable cable layout for the above connections.

(b) In which wing would you place the server ? Explain the reason for your selection.

(c) Suggest the kind of network required (out of LAN, MAN, WAN) for connecting Administrative Wing and Middle Wing.

(d) Suggest the placement of the following devices with justification :

(i) Repeater

(ii) Switch/Hub

40. (continued)

(e) There is one more branch of ABC International School in Mussoorie. The schools want to link ABC International School, Delhi with ABC International School, Mussoorie. Suggest the software(s) or app(s) to share the files and videos.

40-VI. For visually impaired students only, in lieu of question 40:

With reference to computer networking, answer the following questions briefly :

(a) What is the significance of a switch in a computer network ?

(b) Mention the name of any two network topologies.

(c) What is MODEM ?

(d) Explain Gateway briefly.

(e) Expand VoIP.

- End of Question Paper -