Class XII INFORMATICS PRACTICES (065)
SAMPLE PAPER – 1 (THEORY) (2020-21)
(Solved)

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

> *General Instructions:*
>
> 1. This question paper contains two parts, A and B. Each part is compulsory.
> 2. Both Part A and Part B have choices.
> 3. Part A has 2 sections:
>   (a) Section I is short answer questions, to be answered in one word or one line.
>   (b) Section II has two case study questions. Each case study has 5 case-based sub-parts. An examinee is to attempt any 4 out of the 5 sub-parts.
> 4. Part B is Descriptive Paper. Part B has three sections:
>   (a) Section I is short answer questions of 2 marks each in which two questions have internal options.
>   (b) Section II is long answer questions of 3 marks each in which two questions have internal options.
>   (c) Section III is very long answer questions of 5 marks each in which one question has internal option.

PART A – Section I

Attempt any 15 questions from questions 1 to 21.

1. State whether True or False: (1)
  (i) Leaking your company's data to the outside network without prior permission of senior authority is a cyber crime ....
  (ii) Phishing is a term used to describe a malicious individual or a group of individuals who scam users ....

Ans. (i) True   (ii) True

2. Fill in the blanks: (1)

Covid-19 Patient analysis in the Mumbai region is to be plotted. The command used to give title to x-axis as "No. of Patients" in the graph is ....
  (i) `plt.show()`   (ii) `plt.plot("No. of Patients")`
  (iii) `plt.xlabel("No. of Patients")`   (iv) `plt.title("No. of Patients")`

Ans. (iii) `plt.xlabel("No. of Patients")`

3. Write the output of the following SQL command. (1)
```
select
truncate(99.78,0);
```
  (i) `99.78`   (ii) `99.8`
  (iii) `99`   (iv) `100`

Ans. (iii) `99`

4. Given a Pandas series called Marks, the command which will display the last 3 rows is .... (1)
  (i) `print(Marks.tail(3))`   (ii) `print(Marks.Tail(3))`
  (iii) `print(Marks.tails(3)`   (iv) `print(Marks.Tails(3))`

Ans. (i) `print(Marks.tail(3))`

5. Given the following Series S1 and S2: (1)

S1		S2	
A	10	A	80
B	40	B	20
C	34	C	74
D	60	D	90

Write the command to find the product of series S1 and S2.

Ans. `print(s1*s2)`

      `OR`

    `print(s1.mul(s2))`

6. Which of the following statements is used to create a histogram of 'step' type with 20 bins? (1)

  (i) plt.hist(x, bins=20,histype="barstacked")   (ii) plt.hist(x, bins=20)

  (iii) plt.hist(x, bins=20, histype="step")   (iv) plt.hist(x, bins=20, histype=hist()
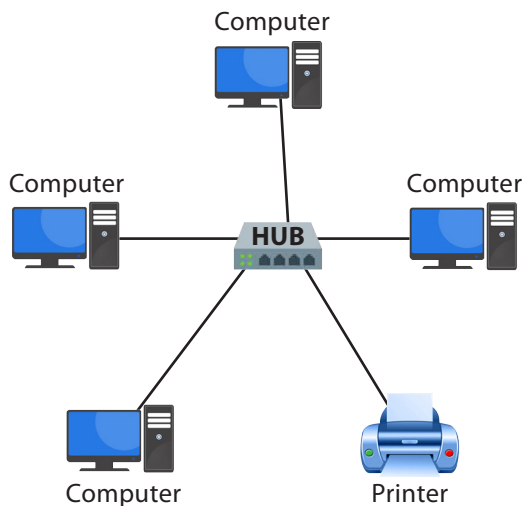
Ans. (i) `plt.hist(x, bins=20, histype="step")`

7. The main function of .... is to divide the message or data into packets of a definite size on the source computer. (1)

Ans. `TCP (Transmission Control Protocol)`

8. In a DataFrame, axis= 0 represents the .... elements. (1)

Ans. `row`

9. Which of the following network topology is shown in the figure: (1)

  (i) Bus   (ii) Star

  (iii) Tree   (iv) Ring

Ans. (i) Star

10. Software application that reside on a computer and is used to locate and display pages and information provided by web servers is defined as a .... (1)

Ans. `Web Browser`

11. The max() function in MySQL is an example of .... (1)

  (i) Math Function   (ii) Text Function

  (iii) Date Function   (iv) Aggregate Function

Ans. (iv) Aggregate Function

12. .... is a term referring to a brand, invention, design or other kind of creation which a person or business has legal rights over. (1)

Ans. Intellectual Property (IP)

13. In Pandas, the function used to fill the missing values in a DataFrame is .... (1)

Ans. `fillna()`

14. I can allow you to make audio calls.

I can allow you to make video calls.

I should be connected to internet-enabled device equipped with microphone and speakers.

Who am I? (1)

Ans. `VoIP (Voice Over Internet Protocol)`

15. Write output of the following code: (1)

```
import pandas as pd
my_series=pd.Series({'Indore':20,'Ujjain':35,'Bhopal':40})
print(my_series[my_series>20])
```

Ans. Ujjain 35

Bhopal 40

16. While sending the email to a number of users, we wish that a particular recipient should be able to see only senders' email id, but not other recipients. Where should we write the email of all recipients, whether in CC or BCC? (1)

Ans. BCC (Blind Carbon Copy)

17. Expand the following: (1)

(i) VOIP   (ii) SMTP

Ans. (i) VOIP- Voice Over Internet Protocol

(ii) SMTP- Simple Mail Transfer Protocol

18. The .... command can be used to modify structure of a table in SQL. (1)

Ans. Alter table command

19. Write output of following code: (1)

```
import pandas as pd
data = [['Ram',10],['Shyam',12],['Rima',13]]
df = pd.DataFrame(data,columns=['Name','Age'],dtype=float)
print( df)
```

Ans.

	Name	Age
0	Ram	10.0
1	Shyam	12.0
2	Rima	13.0

20. .... is a type of program that either pretends to have, or is described as having, a set of useful or desirable features but actually contains malicious code. (1)

Ans. Trojan Horse

21. Name the primary law in India dealing with cybercrime and electronic commerce. (1)

Ans. Information Technology (IT) Act 2000.

Section II

Both the case study-based questions (22 & 23) are compulsory. Attempt any four subparts from each question. Each sub-part carries 1 mark.

22. Assume a data frame df1 that contains data about climatic conditions of various cities with C1, C2, C3, C4 and C5 as indexes shown below and give the output of any four questions from (i) to (v).

	City	MaxTemp	MinTemp	RainFall
C1	Delhi	40	32	24.1
C2	Bengaluru	31	25	36.2
C3	Chennai	35	27	40.8
C4	Mumbai	29	21	35.2
C5	Kolkata	39	23	41.8

(i) >>>df1.shape (1)

Ans. (5,4)

(ii) >>>df1[1:2] (1)

Ans.

```
        City    MaxTemp  MinTemp  RainFall
C2   Bengaluru   31       25       36.2
```

(iii) `>>>df1.loc['C1':'C3','City']` (1)

Ans.
```
C1      Delhi
C2      Bengaluru
C3      Chennai
```

(iv) `>>>df1.iloc[2]` (1)

Ans.
```
City        Chennai
MaxTemp     35
MinTemp     27
RainFall    40.8
```

(v) `>>>df.city` (1)

Ans.
```
Delhi
Bengaluru
Chennai
Mumbai
Kolkata
```

23. Consider the following table given below:

Table: PharmaDB					
RxID	**DrugID**	**DrugName**	**Price**	**Pharmacy Name**	**PharmacyLocation**
R1000	5476	Amlodipine	100.00	RxPharmacy	Pitampura,Delhi
R1001	2345	Paracetamol	15.00	RajMedicos	Bahadurgarh,Haryana
R1002	1236	Nebistar	60.00	MyChemist	Rajouri Garden,Delhi
R1003	6512	VitaPlus	150.00	MyChemist	Gurgaon,Haryana
R1004	5631	Levocitrezine	110.00	RxPharmacy	SouthExtension,Delhi

(i) To increase the price of "Amlodipine" by 50. (1)

Ans. Update PharmaDB set price= price+50 where DrugName="Amlodipine";

(ii) To display the Drug ID, DrugName and Pharmacy Name of all the records in descending order of their price. (1)

Ans. Select DrugID, DrugName, PharmacyName from PharmaDB order by Price desc;

(iii) Delete the field name dateofpurchase. (1)

Ans. `Alter table PharmaDB DROP dateofpurchase;`

(iv) State the command to display all the details of the drugs where the name starts with 'M' and has 'Ch' somewhere in the name. (1)

(a) `Select * from PharmaDB where DrugName LIKE "M%ch%;`
(b) `Select * from PharmaDB where DrugName LIKE "m_ch%";`
(c) `Select * from PharmaDB where DrugName LIKE "m__ch%";`
(d) `Select * from PharmaDB where DrugName LIKE "%ch%m";`

Choose the correct option:
(a) Only (i)   (b) Both (ii) and (iv)
(c) Both (i) and (iii)   (d) Only (iii)

Ans. (a) Only (i)

(v) Help Sachin to display drugname in capital letters along with price rounded off to nearest integer. (1)

(a) `select upper(`**DrugName**`),round(Price,0)from PharmaDB;`
(b) `select toupper(`**DrugName**`),round(Price,0)from PharmaDB;`
(c) `select upper(`**DrugName**`),truncate(Price,0)from PharmaDB;`
(d) `select `**DrugName**`,round(Price,1)from PharmaDB;`

Ans. (a) `select upper(`**DrugName**`),round(Price,0)from PharmaDB;`

24. Write Python code to create the following DataFrame df1 using Python Pandas. Use any method of DataFrame creation that you have learned: (2)

Name	Class	Marks
Tanmay	XII	95
Aditi	X	84
Mehak	XI	90
Kriti	XI	75

Give index as "one", "two", "three", "four" respectively.

Ans.
```
import pandas as pd
d1= {"Name":['Tanmay', 'Aditi', 'Mehak', 'Kriti'],
     "Class":[" XII","X","XI","XI"],"Marks":[95,84,90,75]}
df1=pd.DataFrame(d1,index=["one", "two", "three", "four"])
print(df1)
```

25. State any two differences between instr() and substr() functions in SQL. (2)

OR

What is the difference between where and having clause when used along with the select statement. Explain with an example.

Ans. (i) INSTR function searches string for sub-string and returns an integer indicating the position of the character in string that is the first character of this occurrence whereas SUBSTR function returns a portion of string, beginning at character position, substring_length characters long.

(ii) *For example*, select instr("India is my country",'my');

Output->10

Select substr("We are indians",4,3);

Output -> are

OR

(i) WHERE **is** used to filter records before any groupings take place whereas **HAVING is** used to filter values after they have been groups.

(ii) *For example*, select * from student where marks>85;

For example, select stream, avg(marks) from student group by stream having
stream IN ("Commerce","Humanities");

26. Consider the decimal number x with value 9945.8853. Write commands in SQL to: (2)

(i) round it off up to 2 decimal places.

(ii) round it to 2 places before the decimal.

Ans. (i) select round(9945.8853,2);

(ii) select round(9945.8853,-2);

27. What will be the output of the following program: (2)

```
import pandas as pd
s = pd.Series([1,2,3,4,5],index=['a','b','c','d','e'])
print(s*3)
print(s>2)
s['e']=6
print(s)
```

Ans. a   3
       b   6
       c   9
       d   12
       e   15
       dtype: int64
       a   False
       b   False
       c   True
       d   True
       e   True
       dtype: bool
       a   1
       b   2
       c   3
       d   4
       e   6
       dtype: int64

28. Rinku writes the following commands with respect to table sales having fields, itemno, iname, sales_made, commission.   (2)

Command1 : `Select sum(sales_made) from sales;`

`Gives Output as: 1200`

Command2: `Select avg(sales_made) from sales;`

`Gives Output as: 300`

What will be the cardinality of the table if there is no NULL value for sales_made?

Also give the command to find out the no. of rows in this table.

Ans. The cardinality of the table sales is: 4 since 1200/300 =4

Select count(*) from sales;

29. Consider the following SQL string: "Corporate world"   (2)

Write commands to display:

  (i) "rate"   (ii) "world"

                                    OR

Considering the same string "Corporate world" Write SQL commands to display:

  (i) the position of the substring 'or' in the string "Corporate world"

  (ii) the last 4 letters of the string

Ans. (i) Select substr("Corporate world",6,4);   (ii) Select right("Corporate world",5);

                                    OR

  (i) Select instr("Corporate world","or");   (ii) Select right("Corporate world",4);

30. Mr. Hitesh wants to draw a line chart using a list of elements named LIST. Complete the code to perform the following operations: (2)

  (i) To plot a line chart using the given LIST,

  (ii) To give a y-axis label to the line chart named "Sample Numbers".

```
import matplotlib.pyplot as PLINE
LIST=[10,20,30,40,50,60]
_____ Statement 1
_____ Statement 2
PLINE.show()
```

Ans. (i) PLINE.plot(LIST)

  (ii) PLINE.ylabel("Sample Numbers")

31. Expand the following terms related to Computer Networks: (2)

  (i) IMAP   (ii) POP

(iii) TCP/IP   (iv) HTTPs

Ans. (i) Internet Message Access Protocol

 (ii) Post Office Protocol

(iii) Transmission Control Protocol/Internet Protocol

(iv) Hypertext Transfer Protocol Secure

32. Sujata received an email from her bank stating that there is a problem with her account. The email provides instructions and a link, by clicking on which she can log on to her account and fix the problem. Help Sujata by telling her the precautions she should take when she receives these types of emails. (2)

Ans. She should check whether it is a valid bank site or not by checking in the URL https. It is always better to type the URL and then login to the site. She should not click on the link provided in the email.

33. Ms Sheena has many electronic gadgets which are not usable due to outdated hardware and software. Help her to find any three best ways to dispose the used electronic gadgets. (2)

Ans. (i) Give Your Electronic Waste to a Certified E-Waste Recycler.

 (ii) Donate Your Outdated Technology.

(iii) Give Back to the Electronic Companies and leave at Drop-off Points.

Section II

34. Consider two objects x and y. x is a list whereas y is a Series. Both have values 10, 20, 30,100. (3)

What will be the output of the following two statements considering that the above objects have been created already.

 (i) `print (x+2)`   (ii) `print(y+2)`

Justify your answer.

Ans. (i) TypeError: can only concatenate list (not "int") to list

 (ii) 0   12
     1   22
     2   32
     3   102
     dtype: int64

In the first case, adding integer value to a list is not permitted. You can add list to another list but not an integer value to a list. This is because list does not allow broadcasting operation, i.e., performing arithmetic operation to each element is not permitted.

But in second case, series can very well implement broadcasting operation. Thus, adding an integer value to pandas series is permitted and is perfectly fine; hence the output is so obtained.

35. What is unauthorized access? How confidentiality of data can be maintained? (3)

OR

Explain the difference between a web browser and web server with suitable examples?

Ans. Some data and information stored on computer disks is personal and needs to be kept confidential, such as pay, bank details, and medical records. If someone who is not entitled to see these details can obtain access without permission, it is unauthorized access.

PRACTICES TO ENSURE CONFIDENTIALITY OF INFORMATION

- Use Firewall wherever possible.
- Control browser settings to block tracking.
- Browse privately wherever possible.
- Be careful while posting on the internet.
- Ensure safe sites while entering crucial information.
- Ensure that the address contains prefix as HTTPs and a padlock sign.
- Do not give sensitive information on wireless networks.
- Never save passwords while working on public computer.

Web Browser: A web browser is a software application for accessing information on the World Wide Web. When a user requests a web page from a particular website, the web browser retrieves the necessary content from a web server and then displays the page on the user's device.

Web Server: A web server is a computer that runs websites. The basic objective of the web server is to store, process and deliver web pages to the users. This intercommunication is done using Hypertext Transfer Protocol (HTTP).

Popular web browsers: Google Chrome, Mozilla Firefox, Internet Explorer, etc.

36. A dictionary Grade contains the following: (3)

Grade={'Name':['Rashmi','Harsh','Ganesh', 'Priya','Vivek'],
        'Grade':['A1','A2','B1','A1','B2']}

Write statements for the following:

 (i) Create a Dataframe named "Gr".

 (ii) Add a column called 'marks' with following data:
     [97,92,95,89,96,82]

 (iii) Delete 3rd and 5th rows

<div align="center">OR</div>

Write a program to find the Total salary of all employees in the DataFrame employee without using any aggregate function.

Ans. (i) Gr= pd.DataFrame(Grade)

(ii) Gr["Marks"]=[97,92,95,89,96,82]

(iii) Gr.drop([2,4])

<div align="center">OR</div>

Ans.
```
import pandas as pd
d={"Empno":[1,2,3],"Ename":["Ritu","Ankit","Megha"],"Salary":[12000,15000,28000]}
df=pd.DataFrame(d)
print(df)
sum1=0
for i in range(len(df)):
  sum1=sum1+df.loc[i,'Salary']
  print(sum1)
```

37. A relation Vehicles is given below: (3)

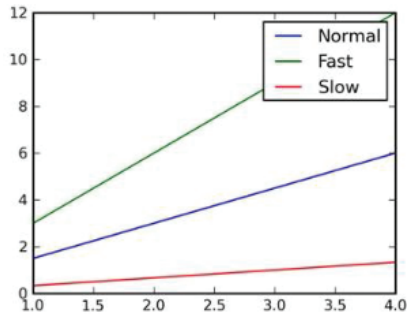| V_no	Type	Company	Price	Qty
TT25	Wagon	Maruti	200000	20
J0043	Jeep	Mahindra	3500000	19
SV98	SUV	Mitsubishi	5000000	20
MV76	Mini van	Datsun	7800000	25
SV599	SUV	Maruti	8000000	26
MV880	Mini van	Mahindra	5600000	19

Write SQLcommands to:

 (i) Display the average price of each type of vehicle having quantity more than 20. (1)

Ans. select avg(price) from vehicles group by type having qty>20;

(ii) Count the type of vehicles manufactured by each company. (1)

Ans. select count(type) from vehicles group by company;

(iii) Display the total price of all types of vehicles. (1)

Ans. select sum(price) from vehicles group by type;

Section III

38. Write a code to plot the speed of a passenger train as shown in the figure given below. (5)

Ans.
```
import matplotlib.pyplot as plt
import numpy as np
x = np.arange(1, 5)
plt.plot(x, x*1.5, label='Normal')
plt.plot(x, x*3.0, label='Fast')
plt.plot(x, x/3.0, label='Slow')
plt.legend()
plt.show()
```

39. Write the SQL statements to perform the following operations: (5)
   (a) To display the name of the month of "2020-10-31".
   (b) To remove spaces from the right side of the string, "Pandas ".
   (c) To display the name of the day, such as Friday or Sunday, from the current date.
   (d) To display the last name from "Arjun Awasthi".
   (e) To calculate number 7 raised to the power of 3.

OR

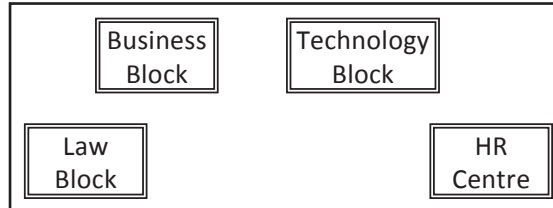Consider the LOANS table given below and give the SQL commands to perform the following:

Table: LOANS

AccNo	Cust_Name	Loan_Amount	Instalments	Int_Rate	Start_Date	Interest
1	R.K. Gupta	300000	36	12.00	19-07-2009	1200
2	S.P. Sharma	500000	48	10.00	22-03-2008	1800
3	K.P. Jain	300000	36	NULL	08-03-2007	1600
4	M.P. Yadav	800000	60	10.00	06-12-2008	2250
5	S.P. Sinha	200000	36	12.50	03-01-2010	4500
6	P. Sharma	700000	60	12.50	05-06-2008	3500
7	K.S. Dhall	500000	48	NULL	05-03-2008	3800

   (a) Display the sum of all Loan Amount whose interest rate is greater than 10.
   (b) Display the Maximum Interest from LOANS table.
   (c) Display the count of all Loan Account Holders whose name ends with 'Sharma'.
   (d) Display interest-wise details of Loan Account Holders with at least 10 instalments remaining.
   (e) Display interest-wise count of all Loan AccountHolders whose due Instalments are more than 5 in each group.

Ans. (a) select monthname("2020-10-31");
   (b) select trim("Pandas ");
   (c) select dayname(curdate());
   (d) select right("Arjun Awasthi",7);
   (e) select pow(7,3);

<p style="text-align:center">OR</p>

Ans. (a) MySQL> Select sum(Loan_Amount) from LOANS Where Int_Rate>10;

(b) MySQL> Select Max(Interest) from LOANS;

(c) MySQL> Select Count(*) from LOANS Where Cust_Name Like '%Sharma';

(d) MySQL> Select * from LOANS Group By Interest Having Instalments>=10;

(e) MySQL> Select Count (*) from LOANS Group By Interest Having Instalments>5;

40. Chanakya University is setting up its academic blocks at Dehradun and is planning to set up a network. The University has 3 academic blocks and one Human Resource Centre as shown in the diagram below: (5)

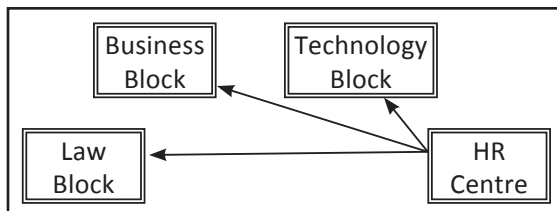Centre-to-Centre distances between various blocks/centre is as follows:

Law Block to business Block	40m
Law Block to Technology Block	80m
Law Block to HR Centre	105m
Business Block to technology Block	30m
Business Block to HR Centre	35m
Technology block to HR Centre	15m

Number of computers in each of the blocks/centres is as follows:

Law Block	15
Technology Block	40
HR Centre	115
Business Block	25

(a) Suggest the most suitable place (*i.e.*, block/centre) to install the server of this University with a suitable reason.

Ans. Most suitable place to install the server is HR centre as this centre has maximum number of computers.

(b) Suggest an ideal layout for connecting these blocks/centres for a wired connectivity.

Ans.

(c) Which device will you suggest to be placed/installed in each of these blocks/centres to efficiently connect all the computers within these blocks/centres?

Ans. Switch

(d) Suggest the placement of a Repeater in the network with justification.

Ans. Law block to Technology block

Law block to HR Centre

Repeater may be placed when the distance between 2 buildings is more than 70 metres.

(e) The university is planning to connect its admission office in Delhi which is more than 1,250 km from the university. Which type of network out of LAN, MAN or WAN will be formed? Justify your answer.

Ans. WAN, as the given distance is more than the range of LAN and MAN.