The Air Force School
Subroto Park

Decoding the Sample paper 2023

Informatics Practices
Class XII
2022-23

Analysis of Sample Paper

No. of Questions : 35

Total Marks : 70

Marks	Number of Questions
1 mark	18
2 marks	7
3 marks	5
4 marks	2
5 marks	3

Unit Wise Weightage

1. Data Handling using Pandas and Data Visualization – 25 marks

2. Database Query using SQL – 25 marks

3. Introduction to Computer Networks – 10 marks

4. Societal Impact - 10 marks

Pattern of Question Paper

Q1-Q18 **1 Mk each**	Q1 Networking MCQ	Q2 Cyber MCQ	Q3 Cyber MCQ	Q4 SQL MCQ	Q5 SQL MCQ
Q6 Networking MCQ	Q7 SQL MCQ	Q8 SQL MCQ	Q9 SQL MCQ	Q10 Pandas MCQ	Q11 Pandas MCQ
Q12 Pandas SQL	Q13 Networking MCQ	Q14 SQL MCQ	Q15 Cyber MCQ	Q16 Cyber MCQ	Q17 AR Networking
Q18 AR Data Frame	**Q19-Q25** **2 Mks each**	Q19 Networking (Ch)	Q20 SQL Error	Q21 SQL Theory	Q22 Pandas Program
Q23 Cyber Theory	Q24 Pandas Output	Q25 DataFrame Output	**Q26-Q30** **3 Mks Each**	Q26 SQL Query	Q27 DataFrame Program
Q28 DataFrame Statements	Q29 Cyber Theory (Ch)	Q30 SQL Query / Theory (Ch)	**Q31-Q33** **5 Mks each**	Q31 SQL Query Library (Ch)	Q32 Networking Case study
Q33 PyPlot Program (Graph) (Ch) Choice between Line and Bar chart	**Q34-Q35** **4 Mks each**	Q34 SQL Query / Theory (Ch)	Q35 DataFrame Program / Output (Ch)		

Ar- Reasoning and Assertion Based
Ch –Internal choice given.

Blue Print of Sample Paper

Topic	MCQ (1 mark)	2 Mark	3 Mark	4 Mark	5 Mark	Total	No of qs
Data Handling using Pandas and Data Visualization	4	3	2	1	1	25	11
Database Query using SQL	6	2	2	1	1	25	12
Introduction to Computer Networks	3	1			1	10	5
Societal Impact	5	1	1			10	7

General Instructions:

1. The question paper will have five sections, Section A to E.

2. All questions are compulsory (except for internal choices)

3. Section A will have 18 questions carrying 01 mark each.

4. Section B will have 07 Very Short Answer type questions carrying 02 marks each.

5. Section C will have 05 Short Answer type questions carrying 03 marks each.

6. Section D will have 03 Long Answer type questions carrying 05 marks each.

7. Section E will have 02 questions carrying 04 marks each. One internal choice will be given in Q35.

8. All programming questions are to be answered using **Python Language** only.

Ques No	Topics/Unit	Marks
1.	Introduction to networking	1
2.	Societal Impact	1
3.	Societal Impact	1
4.	Database Query using SQL	1
5.	Database Query using SQL	1
6.	Societal Impact	1
7.	Database Query using SQL	1
8.	Database Query using SQL	1
9.	Database Query using SQL	1
10.	Data Handling using Pandas and Data Visualization	1
11.	Data Handling using Pandas and Data Visualization	1
12.	Data Handling using Pandas and Data Visualization	1
13.	Introduction to networking	1
14.	Database Query using SQL	1
15.	Societal Impact	1
16.	Societal Impact	1
17.	Introduction to networking	1
18.	Data Handling using Pandas and Data Visualization	1
19.	Introduction to networking	2
20.	Database Query using SQL	2
21.	Database Query using SQL	2
22.	Data Handling using Pandas and Data Visualization	2
23.	Introduction to networking or Societal Impact	2
24.	Data Handling using Pandas and Data Visualization	2
25.	Data Handling using Pandas and Data Visualization	2
26.	Database Query using SQL	3
27.	Data Handling using Pandas and Data Visualization	3
28.	Data Handling using Pandas and Data Visualization	3
29.	Societal Impact	3
30.	Database Query using SQL	3
31.	Database Query using SQL	5
32.	Introduction to networking	5
33.	Data Handling using Pandas and Data Visualization	5
34.	Database Query using SQL	4
35.	Data Handling using Pandas and Data Visualization	4

SOLVED QUESTIONS OF SAMPLE PAPER 2022-23 UNITWISE

UNIT 1

Data Handling using Pandas and Data Visualization

10. To display last five rows of a series object **'S'**, you may write: 1
i. S.Head()
ii. S.Tail(5)
iii. S.Head(5)
iv. **S.tail()**

11. Which of the following statement will import pandas library? 1
i. Import pandas as pd
ii. import Pandas as py
iii. **import pandas as pd**
iv. import panda as pd

18. Assertion (A):- DataFrame has both a row and column index. 1
Reasoning (R): - A DataFrame is a two-dimensional labelled data structure like a table of MySQL.
i. Both A and R are true and R is the correct explanation for A
ii. Both A and R are true and R is not the correct explanation for A
iii. A is True but R is False
iv. A is false but R is True

22. Write a program to create a series object using a dictionary that stores the number of students in each house of class 12D of your school. 2
Note: Assume four house names are Beas, Chenab, Ravi and Satluj having 18, 2, 20, 18 students respectively and pandas library has been imported as pd.

St={'Beas' :18, 'Chenab' :20 , ' Ravi' :20, ' Satluj' :18}
S1=pd.Series(St)

24. What will be the output of the following code: 2
>>>import pandas as pd
>>>A=pd.Series(data=[35,45,55,40])
>>>print(A>45)

```
0    False
1    False
2     True
3    False
```

25. Carefully observe the following code: 2

```
import pandas as pd
Year1={'Q1':5000,'Q2':8000,'Q3':12000,'Q4': 18000}
Year2={'A' :13000,'B':14000,'C':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.

i. **The index labels of df will include Q1,Q2,Q3,Q4,A,B,C**

ii. The column names of df will be: 1,2

27. Write a Python code to create a DataFrame with appropriate column headings from the list given below: 3

[[101,'Gurman',98],[102,'Rajveer',95],[103,'Samar' ,96],[104,'Yuvraj',88]]

```
import pandas as pd
data=[[101,'Gurman',98],[102,'Rajveer',95],[103,'Samar' ,96],
[104,'Yuvraj',88]]
df=pd.DataFrame(data,columns=['Rno','Name', 'Marks'])
```

28. Consider the given DataFrame 'Stock': 3

	Name	Price
0	Nancy Drew	150
1	Hardy boys	180
2	Diary of a wimpy kid	225
3	Harry Potter	500

Write suitable Python statements for the following:

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.

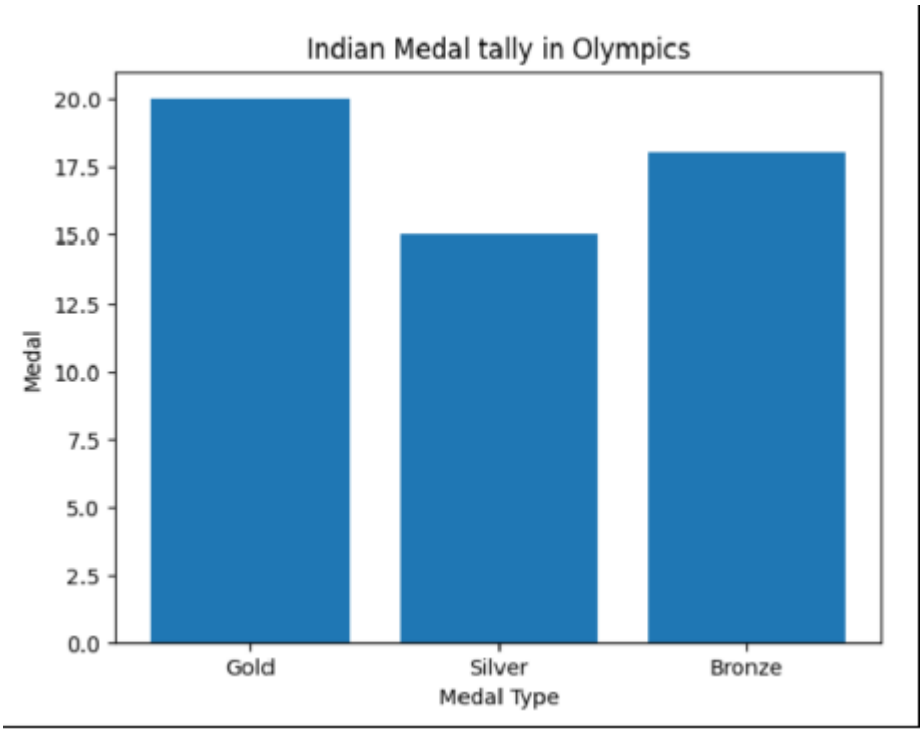
iii. Remove the column Special_Price.

i. Stock['Special_Price']=[135,150,200,400]

ii. Stock.loc['4']=['The Secret',800]

iii. Stock=Stock.drop('Special_Price',axis=1)

33. Write Python code to plot a bar chart for India's medal tally as shown below: Also give suitable python statement to save this chart. 5



OR

Write a python program to plot a line chart based on the given data to depict the changing weekly average temperature in Delhi for four weeks.
Week=[1,2,3,4]
Avg_week_temp=[40,42,38,44]

```
import matplotlib.pyplot as plt
Category=['Gold','Silver','Bronze']
Medal=[20,15,18]
plt.bar(Category,Medal)
plt.ylabel('Medal')
plt.xlabel('Medal Type')
plt.title('Indian Medal tally in Olympics')
plt.show()
```

Python statement to save the chart:
plt.savefig("aa.jpg")

OR

```
import matplotlib.pyplot as plt
Week=[1,2,3,4]
Avg_week_temp=[40,42,38,44]
plt.plot(Week,Avg_week_temp)
plt.show()
```

35. Mr. Som, a data analyst has designed the DataFrame df that contains data about Computer Olympiad with 'CO1', 'CO2', 'CO3', 'CO4', 'CO5' as indexes shown below. Answer the following questions: (1+1+2)

	School	Tot_students	Topper	First_Runnerup
CO1	**PPS**	**40**	**32**	**8**
CO2	**JPS**	**30**	**18**	**12**
CO3	**GPS**	**20**	**18**	**2**
CO4	**MPS**	**18**	**10**	**8**
C05	**BPS**	**28**	**20**	**8**

A. Predict the output of the following python statement:
i. df.shape
ii. df[2:4]

i. (5,4)

ii.

	School	tot_students	Topper	First_Runner_up
CO3	**GPS**	**20**	**18**	**2**
CO4	**MPS**	**18**	**10**	**8**

B. Write Python statement to display the data of Topper column of indexes CO2 to CO4.

OR (Option for part iii only)

Write Python statement to compute and display the difference of data of Tot_students column and First_Runnerup column of the above given DataFrame.

B. **Python statement:**
print(df.loc['CO2': 'CO4', 'Topper'])
OR
print(df.Tot_students-df.First_Runnerup)

UNIT 2
Database Query using SQL

4 Which type of values will not be considered by SQL while executing the following statement?
SELECT COUNT(column name) FROM inventory;
i. Numeric value
ii. text value
iii. Null value
iv. Date value

5. If column “Fees” contains the data set (5000,8000,7500,5000,8000), what will be the output after the execution of the given query?
SELECT SUM (DISTINCT Fees) FROM student;
i. 20500
ii. 10000
iii. 20000
iv. 33500

7. Which SQL statement do we use to find out the total number of records present
in the table ORDERS?
i. SELECT * FROM ORDERS;
ii. SELECT COUNT (*) FROM ORDERS;
iii. SELECT FIND (*) FROM ORDERS;
iv. SELECT SUM () FROM ORDERS;

8. Which one of the following is not an aggregate function?
i. **ROUND()**
ii. SUM()
iii. COUNT()
iv. AVG()

9. Which one of the following functions is used to find the largest value from the given data in MySQL?
i. MAX( )
ii. MAXIMUM( )
iii. BIG( )
iv. LARGE( )

14. In SQL, which function is used to display current date and time?
i. Date ()
ii. Time ()
iii. Current ()
iv. Now ()

20. Rashmi, a database administrator needs to display house wise total number of records of **'Red'** and **'Yellow'** house. She is encountering an error while executing the following query: 2

SELECT HOUSE, COUNT (*) FROM STUDENT GROUP BY HOUSE WHERE HOUSE='RED' OR HOUSE= 'YELLOW';

Help her in identifying the reason of the error and write the correct query by suggesting the possible correction (s).

SELECT HOUSE, COUNT(*) FROM STUDENT GROUP BY HOUSE HAVING HOUSE='RED' OR HOUSE= 'YELLOW';

21. What is the purpose of Order By clause in SQL? Explain with the help of suitable example. 2

The ORDER BY command is used to sort the result set in ascending or descending order.
The following SQL statement displays all the names in alphabetic order:

SELECT Cname FROM Customers ORDER BY Cname;

26. Write outputs for SQL queries (i) to (iii) which are based on the given table PURCHASE: 3

TABLE: PURCHASE

CNO	CNAME	CITY	QUANTITY	DOP
C01	GURPREET	NEW DELHI	150	2022-06-11
C02	MALIKA	HYDERABAD	10	2022-02-19
C03	NADAR	DALHOUSIE	100	2021-12-04
C04	SAHIB	CHANDIGARH	50	2021-10-10
C05	MEHAK	CHANDIGARH	15	2021-10-20

i. SELECT LENGTH(CNAME) FROM PURCHASE WHERE QUANTITY>100;
ii. SELECT CNAME FROM PURCHASE WHERE MONTH(DOP)=3;
iii. SELECT MOD (QUANTITY, DAY(DOP)) FROM PURCHASE WHERE CITY= 'CHANDIGARH'**;**

i. 8
ii. No output
iii. 0
15

30 Based on table **STUDENT** given here, write suitable SQL queries for the following: 3

Roll No	Name	Class	Gender	City	Marks
1	Abhishek	XI	M	Agra	430
2	Prateek	XII	M	Mumbai	440
3	Sneha	XI	F	Agra	470
4	Nancy	XII	F	Mumbai	492
5	Himnashu	XII	M	Delhi	360
6	Anchal	XI	F	Dubai	256
7	Mehar	X	F	Moscow	324
8	Nishant	X	M	Moscow	429

i. Display gender wise highest marks.
ii. Display city wise lowest marks.
iii. Display total number of male and female students.
OR
Discuss the significance of Group by clause in detail with the help of suitable example.

i. **select max(marks) from student group by gender;**
ii. select min(marks) from student group by city;
iii. select gender,count(gender) from student group by gender;
or

GROUP BY clause is used in a SELECT statement in combination with aggregate functions to group the result based on distinct values in a column.
For example:
To display total number of male and female students from the table STUDENT, we need to first group records based on the gender then we should count records with the help of count() function.

For example
select gender,count(gender) from student group by gender; will give the number of male and female students

Output:
Gender Count(Gender)
M 4
F 4

31 Write suitable SQL query for the following: 5
i. Display 7 characters extracted from 7th left character onwards from the string 'INDIA SHINING'.
ii. Display the position of occurrence of string 'COME' in the string 'WELCOME WORLD'.
iii. Round off the value 23.78 to one decimal place.
iv. Display the remainder of 100 divided by 9.
v. Remove all the expected leading and trailing spaces from a column userid of the table **'USERS'**.

OR
Explain the following SQL functions using suitable examples.
i. UCASE()
ii. TRIM()
iii. MID()
iv. DAYNAME()
iv. POWER()

i. **select mid('INDIA SHINING',7,7);**
ii. select INSTR('WELCOME WORLD','COME');
iii. select round(23.78,1);
iv. select mod(100,9);
v. select trim(userid) from users;

OR

1. UCASE(): It converts the string into upper case.
2. TRIM(): It removes the leading and trailing spaces from the given string.
3. **MID():** It extracts the specified number of characters from given string.
4. **DAYNAME():** It returns the weekday name for a given date
5. POWER(): It returns the value of a number raised to the power of another number.
Example:
SELECT POW(6,2);
Output:
36

34. Shreya, a database administrator has designed a database for a clothing shop. Help her by writing answers of the following questions based on the given table: (1+1+2)

TABLE CLOTH

CCODE	CNAME	SIZE	COLOR	PRICE	dop
C001	JEANS	XL	BLUE	990	2022-01-21
C002	T SHIRT	M	RED	599	2021-12-12
C003	TROUSER	M	GREY	399	2021-11-10
C004	SAREE	FREE	GREEN	1299	2019-11-12
C005	KURTI	L	WHITE	399	2021-12-07

i. Write a query to display cloth names in lower case.
ii. Write a query to display the lowest price of the cloths.
iii. Write a query to count total number of cloths purchased of medium size.

i. **SELECT LOWER(CNAME) FROM CLOTH;**
ii. SELECT MIN(PRICE) FROM CLOTH;
iii. SELECT COUNT(*) FROM CLOTH GROUP BY SIZE HAVING SIZE='M';
OR
SELECT YEAR(DOP),COUNT(*) FROM CLOTH GROUP BY YEAR(DOP);

UNIT 3

Introduction to Computer Networks

1. Television cable network is an example of:
i. LAN
ii. WAN
iii. **MAN**
iv. Internet

13. Which amongst the following is not an example of a browser?
i. Chrome
ii. Firefox
iii. **Avast**
iv. Edge

17. Assertion (A): - Internet cookies are text files that contain small pieces of data, like a username, password and user's preferences while surfing the internet.
Reasoning (R):- To make browsing the Internet faster & easier, its required to store certain information on the server's computer.

i. Both A and R are true and R is the correct explanation for A
ii. Both A and R are true and R is not the correct explanation for A
iii. A is True but R is False
iv. A is false but R is True

19. Explain the terms Web page and Home Page. 2

OR

Mention any four networking goals.

Web Page: A Web Page is a part of a website and is commonly written in HTML. It can be accessed through a web browser.

Home Page: It is the first web page you see when you visit a website.

Or

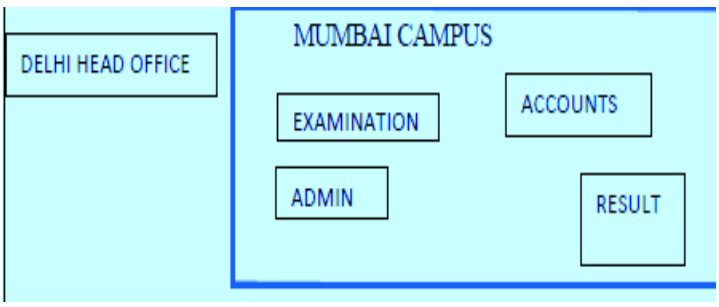
Four networking goals are:

i. **Resource sharing**
ii. **Reliability**
iii. **Cost effective**
iv. **Fast data sharing**

23. Mention any four net etiquettes. 2

No copyright violation
Share the expertise with others on the internet
Avoid cyber bullying
Respect other's privacy and diversity

32. Prime Computer services Ltd. is an international educational organization. It is planning to set up its India campus at Mumbai with its head office in Delhi. The Mumbai office campus has four main buildings-ADMIN, ACCOUNTS, EXAMINATION and RESULT.
You as a network expert have to suggest the best network related solutions for their problems raised in (i) to (v), keeping in mind the distances between the buildings and other given parameters. 5



Shortest distances between various buildings: ADMIN TO ACCOUNTS	55 m
ADMIN TO EXAMINATION	90 m
ADMIN TO RESULT	50 m
ACCOUNTS TO EXAMINATION	55 m
ACCOUNTS TO RESULT	50 m
EXAMINATION TO RESULT	45 m
DELHI Head Office to MUMBAI campus	2150 m

Number of computers installed at various buildings are as follows:

ADMIN	110
ACCOUNTS	75
EXAMINATION	40
RESULT	12
DELHI HEAD OFFICE	20

(i) Suggest the most appropriate location of the server inside the MUMBAI campus (out of the four buildings) to get the best connectivity for maximum number of computers. Justify your answer.

(ii) Suggest and draw cable layout to efficiently connect various buildings within the MUMBAI campus for a wired connectivity.

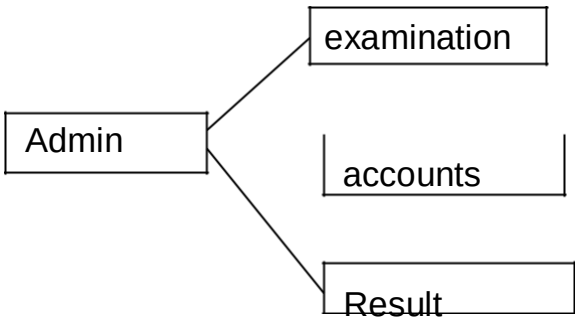
(iii) Which networking device will you suggest to be procured by the company to interconnect all the computers of various buildings of MUMBAI campus?

(iv) Company is planning to get its website designed which will allow students to see their results after registering themselves on its server. Out of the static or dynamic, which type of website will you suggest?

(v) Which of the following will you suggest to establish the online face to face communication between the people in the ADMIN office of Mumbai campus and Delhi head office?
a) Cable TV
b) Email
c) Video conferencing
d) Text chat

i. Server should be installed in Admin department as it has maximum number of computers.

ii.



Star topology

iii. Hub/Switch
iv. Dynamic
v. Video conferencing

UNIT 4
Societal Impact

2. Which of the following is not a type of cyber crime?
i. Data theft
ii. **Installing antivirus for protection**
iii. Forgery
iv. Cyber bullying

3. What is an example of e-waste?
i. A ripened mango
ii. Unused old shoes
iii. **Unused old computers**
iv. Empty cola cans

6. 'O' in FOSS stands for:
i. Outsource
ii**. Open**
iii. Original
iv. Outstanding

15. Legal term to describe the rights of a creator of original creative or artistic work is:
i. **Copyright**
ii. Copyleft
iii. GPL
iv. FOSS

16. _____is the trail of data we leave behind when we visit any website (or use any online application or portal) to fill-in data or perform any transaction.
i. Offline phishing
ii. Offline footprint
iii. **Digital footprint**
iv. Digital phishing

23. List any four benefits of e-waste management. 2

The e-waste management-

i. **Saves the environment and natural resources**
ii. **Allows for recovery of precious metals**
iii. **Protects public health and water quality**
iv. **Saves landfill space**

29. Nadar has recently shifted to a new city and school. She does not know many people in her new city and school. But all of a sudden, someone is posting negative, demeaning comments on her social networking profile etc.
She is also getting repeated mails from unknown people. Every time she goes online, she finds someone chasing her online. 3
i. What is this happening to Nadar?
ii. What immediate action should she take to handle it?
iii. Is there any law in India to handle such issues? Discuss briefly.
OR

What do you understand by plagiarism? Why is it a punishable offence? Mention any two ways to avoid plagiarism.

i. Nadar has become a victim of cyber bullying and cyber stalking.

ii. She must immediately bring it into the notice of her parents and school authorities. And she must report this cyber crime to local police with the help of her parents.

iii. Yes.
The Information Technology Act, 2000 (also known as ITA-2000, or the IT Act) is the primary law in India dealing with cybercrime and electronic commerce.

OR

Ans. Plagiarism is the act of using or stealing someone else's intellectual work, ideas etc. and passing it as your own work. In other words, plagiarism is a failure in giving credit to its source.

Plagiarism is a fraud and violation of Intellectual Property Rights. Since IPR holds a legal entity status, violating its owners right is a legally punishable offence.

Any two ways to avoid plagiarism:

1. **Be original**
2. **Cite/acknowledge the source**

SYLLABUS COMPONENTS

- Python Pandas
  - Series
  - Dataframes
  - Data Visualization
- Database Query using SQL
- Introduction to computer networks
- Societal impacts

Objective Questions (Fill, MCQ, T/F, Full forms, One word)

Subjective Questions

Case Study Based Questions

SOME IMPORTANT TIPS

How to solve Networking Questions in Board paper

Q.-XYZ University of India is starting its first campus in Bangalore, South India, with its center admission office in Delhi. The University has 4 major blocks, i.e Office Block, Science Block, Commerce Block and Humanities Block in a 4 km are Campus. As a network expert, you need to suggest the network plan for the given queries to the authorities keeping in mind the distance and other given parameters.

Expected wired distances between different locations-

Office Block to Science Block	90 m
Office Block to Commerce Block	80 m
Office Block to Humanities Block	70 m
Humanities Block to Science Block	35 m
Humanities Block to Commerce Block	50 m
Commerce Block to Science Block	15 m
Bangalore Campus to Delhi Admission office	2176 km

Expected no. of computers to be installed at various locations:

Office Block	10
Science Block	130
Commerce Block	35
Humanities Block	25
Delhi Admission Office	5

1. Suggest most suitable place(i.e. block) to house the server of this University campus for connecting the blocks.
Ans The server should be installed in Science block, since Science block has maximum number of Computers, and if server is installed in the block, it will help reduce the network traffic.

2- Suggest an efficient device to be installed in each of the blocks to connect all the computers. Justify. Where should a hub/switch be installed.
Ans- Hub/SWITCH should be placed in each block to connect all the computers . Switch can be installed if money is no constraint because its more efficient than hub, since it sends the data packet to the intended node only, thereby reducing the network traffic.

3. What type of topology is being formed in connecting the computers of various blocks.
Ans Star Topology (mostly your answer will be Star or bus wherever the cable length required is less)

4 Suggest the most suitable (very high speed) service to provide data connectivity between Admission office in Delhi and University campus Bangalore
Ans- Satellite Connection. (Since high speed mentioned)

5. Suggest the communication media, to be procured by the University for connecting its local blocks in Bangalore for very effective (High communication).
Ans.6- Optical Fibers
incase economically – Twisted pair/Ethernet Cable

For communication in hilly region/difficult terrain – radio waves

6. - What kinds of network is being formed within the University Campus? And which type of network is formed between Delhi Admission office and Bangalore University campus?
Ans-
i) Within the University campus – **LAN** (Local Area Network)
ii) Between Delhi Admission office and Bangalore University campus – **WAN** (Wider Area Network)

7. Which hardware/software device would you suggest to be procured by the University to be installed to protect and control the internet uses within the Campus?

Ans- Firewall or Router

8. Which service/protocol will be most helpful to establish online face-to- face live communication between the people in Bangalore campus and Delhi admission office?

Ans Video Conferencing or VoIP (Voice over Internet Protocol)

9. Do you need any repeater to be placed between any two blocks? Justify your answer.

Ans No, because Repeaters are generally placed when distance between two computers is 70 m or more. Ethernet cable can transmit data maximum to a distance of 100mt hence repeater should be placed before this distance.

MySQL

Functions

Q1. Write the output that the following statements will produce:

a) SELECT ROUND(7.3456, 2); 7.35
b) SELECT TRUNCATE(2.3456, 2); 2.34
c) SELECT DAYOFMONTH('2009-08-25'); 25
d) SELECT MONTH('2010-02-26'); 02
e) SELECT RIGHT('Informatics', 4); tics
f)SELECT SUBSTR('GOOD MORNING',4,5); D MOR
g)SELECT INSTR('WELCOME U IN THIS WELL','WEL'); 1
h)SELECT MID('VIRUS INFECTION',-9,5) INFEC
I) SELECT ROUND(5678.789,-2) 5700
J) SELECT TRUNCATE(5678.789,-2) 5600

Data Visualization and Pandas

Q1. Consider the following Series object ITEM, where Iname is the index and cost is the data.

a. Write the command which will display the cost for Pizza.
b. Write the command which will display the cost for Pizza and Burger.
c. Write the command to increase price of all items by 10.
d. Give output: → S *2 → S+2

Iname	Cost
Pizza	200
Burger	100
Momos	125
Maggi	50

```
>>> import pandas as pd
>>> S=pd.Series(data=[200,100,125,50],index=['Pizza','Burger','Momos','Maggi'])
>>> S['Pizza']
200
>>> S[['Pizza','Burger']]
Pizza     200
Burger    100
dtype: int64
>>> S=S+10
>>> S
Pizza     210
Burger    110
Momos     135
Maggi      60
dtype: int64
```

If you don't assign the value back then the actual series is not updated

```
>>> S*2
Pizza     400
Burger    200
Momos     250
Maggi     100
dtype: int64
>>> S+2
Pizza     202
Burger    102
Momos     127
Maggi      52
dtype: int64
```

Give output: N=np.arrange(2,8,2) S=pd.Series(N) Print(S)	Give output: N=[15,16,17] S=pd.Series(data=N*2) print(S)
0 2 1 4 2 6 3 8	0 15 1 16 2 17 3 15 4 16 5 17
0 2 1 4 2 6	0 30 1 32 2 34

Be careful whether N is a list or an array !!!!!

→Give output: S=pd.Series([11,12,13],index=['a','b','c']) print(S>12)	
a False b False c True	c 13

→ We must also knowhow to update data in a series.
Eg: S['b']=67
So, now the series S will contain:
a 11
b 67
c 13

WHILE PERFORMING CALCULATIONS WITH SERIES:

```
>>> S=pd.Series([11,12,13],index=['a','b','c'])
>>> S1=pd.Series([1,2,3])
>>> S3=pd.Series([6,7,8],index=['a','b','c'])
>>> S+S1
a   NaN
b   NaN
c   NaN
0   NaN
1   NaN
2   NaN
dtype: float64
>>> S+S3
a    17
b    19
c    21
dtype: int64
```

Remember!!!!!! Indexes must be same for the proper calculation result in between 2 series.

TALKING ABOUT DATA FRAMES IN PANDAS

Various Operations:

1. Adding columns
2. Adding Rows
3. Deleting Columns
4. Deleting Rows
5. Updating details in dataframe (column /index/row data)
6. Searching For data
   - ✓ By Column / Row Labels (Label Indexing)
   - ✓ By content specifications (Boolean Indexing)
   - ✓ Combination of Both
7. Transfer of data between CSV file and dataframe
8. Checking the various attributes of dataframe

CONSIDER A DATAFRAME STORING THE DETAILS OF THE MEMBERS OF RWA

	name	count	car
11	Monika verma	1	Y
12	Piyush Goyal	4	N
13	Raima sen	2	Y
14	Parth Gupta	3	Y
15	Arun Dang	4	N

```
import pandas as pd
d1={'name':['Monika verma','Piyush Goyal','Raima sen','Parth Gupta','Arun Dang']
    'count':[1,4,2,3,4],
    'car':['Y','N','Y','Y','N']
    }
rwa=pd.DataFrame(d1, index=[11,12,13,14,15])
print(rwa)
```

Ways to delete Columns

Method 1: del dataframe['col name']

Method 2: dataframe.pop('col name')

Method 3: dataframe.drop()

by default temporary deletion

Use inplace = True For permanent delete in drop()

Note: with Method 1 and 2 we can delete one col permanently, but with Method 3 we can have temporary as well as permanent deletion option of multiple cols.

axis =0 refers to rows axis=1 refers to columns By default axis=0

Three ways to extract data from dataframes using Labels (for updation or display)

1. [ ]

[ ] are used in pandas to **specify column/row indexes directly** for selection or specify range of column indexes

Examples of various usages:

1. >>>df['names']
2. >>>df [['names','class']]
3. >>> df [:5]
4. >>>df [: : 2]
5. >>>df [: : -1]

This way it is applicable for rows

	names	phy	chem	eng	class
100	sush	34.0	78	50	9
101	adarsh	NaN	90	55	10
102	ravi	56.0	50	67	10
103	manu	67.0	65	68	11
104	sushma	NaN	90	69	11

2 .loc

`.loc` is **primarily row label based** Allowed inputs are:

- A single row label
- A list or array of row labels `['a', 'b', 'c']`.
- A slice object with row labels `'a':'f'` Endpoints are inclusive
- A combination of row and column label to extract one value

Examples:

1. df.loc[101]
2. df.loc[[102,104]]
3. df.loc[100:104]
4. df.loc[100:104:2]
5. df.loc[102,'chem']
6. df.loc[104,['phy','chem']]

	names	phy	chem	eng	class
100	sush	34.0	78	50	9
101	adarsh	NaN	90	55	10
102	ravi	56.0	50	67	10
103	manu	67.0	65	68	11
104	sushma	NaN	90	69	11

NOTE: DO NOT USE DEFAULT INDEX VALUES WITH .loc
WHILE USING SLICING DO NOT USE ANOTHER SET OF [] WITHIN []

3 .iloc

Endpoints are not inclusive

.iloc is **primarily integer position** based (from 0 to length-1 of the axis). Allowed inputs are:

→An default index value e.g. 5.→ index values of rows & columns

→ A list of default indexes [4,3,0] (for rows and columns)

→ A slice of indexes 1:7

Examples:

1. df.iloc[1]
2. df.iloc[[0,3]]
3. df.iloc[1:3]
4. df.iloc[0:4:2]
5. df.iloc[1,[2,3]]
6. df.iloc[0:3,1:3]

	names	phy	chem	eng	class
100	sush	34.0	78	50	9
101	adarsh	NaN	90	55	10
102	ravi	56.0	50	67	10
103	manu	67.0	65	68	11
104	sushma	NaN	90	69	11

NOTE: ~~DO NOT USE INDEX LABELS WITH .iloc.~~

WHILE USING SLICING DO NOT USE ANOTHER SET OF [] WITHIN []

	name	count	car
11	Monika verma	1	Y
12	Piyush Goyal	4	N
13	Raima sen	2	Y
14	Parth Gupta	3	Y
15	Arun Dang	4	N

Q1. Add a column to store phone number of all residents.

Q2. Add the details of the member staying in flat no 16.

Q3. Delete the column named "count" temporarily

```
>>> rwa.loc[16]=['Manan Mehta',5,'Y',8900768695]
>>> rwa
           name  count car       phone
11  Monika verma      1   Y  9811451125
12  Piyush Goyal      4   N  8089789899
13     Raima sen      2   Y  7890675645
14   Parth Gupta      3   Y  9811345678
15     Arun Dang      4   N  9092887654
16   Manan Mehta      5   Y  8900768695
>>> rwa.drop(columns=['count'])
           name car       phone
11  Monika verma   Y  9811451125
12  Piyush Goyal   N  8089789899
13     Raima sen   Y  7890675645
14   Parth Gupta   Y  9811345678
15     Arun Dang   N  9092887654
16   Manan Mehta   Y  8900768695
```

```
>>> rwa['phone']=[9811451125,8089789899,7890675645,9811345678,9092887654]
>>> rwa
           name  count car       phone
11  Monika verma      1   Y  9811451125
12  Piyush Goyal      4   N  8089789899
13     Raima sen      2   Y  7890675645
14   Parth Gupta      3   Y  9811345678
15     Arun Dang      4   N  9092887654
```

```
            name  count car
11  Monika verma      1   Y
12  Piyush Goyal      4   N
13     Raima sen      2   Y
14   Parth Gupta      3   Y
15     Arun Dang      4   N
```

Q4. Delete the details of flat number 13.

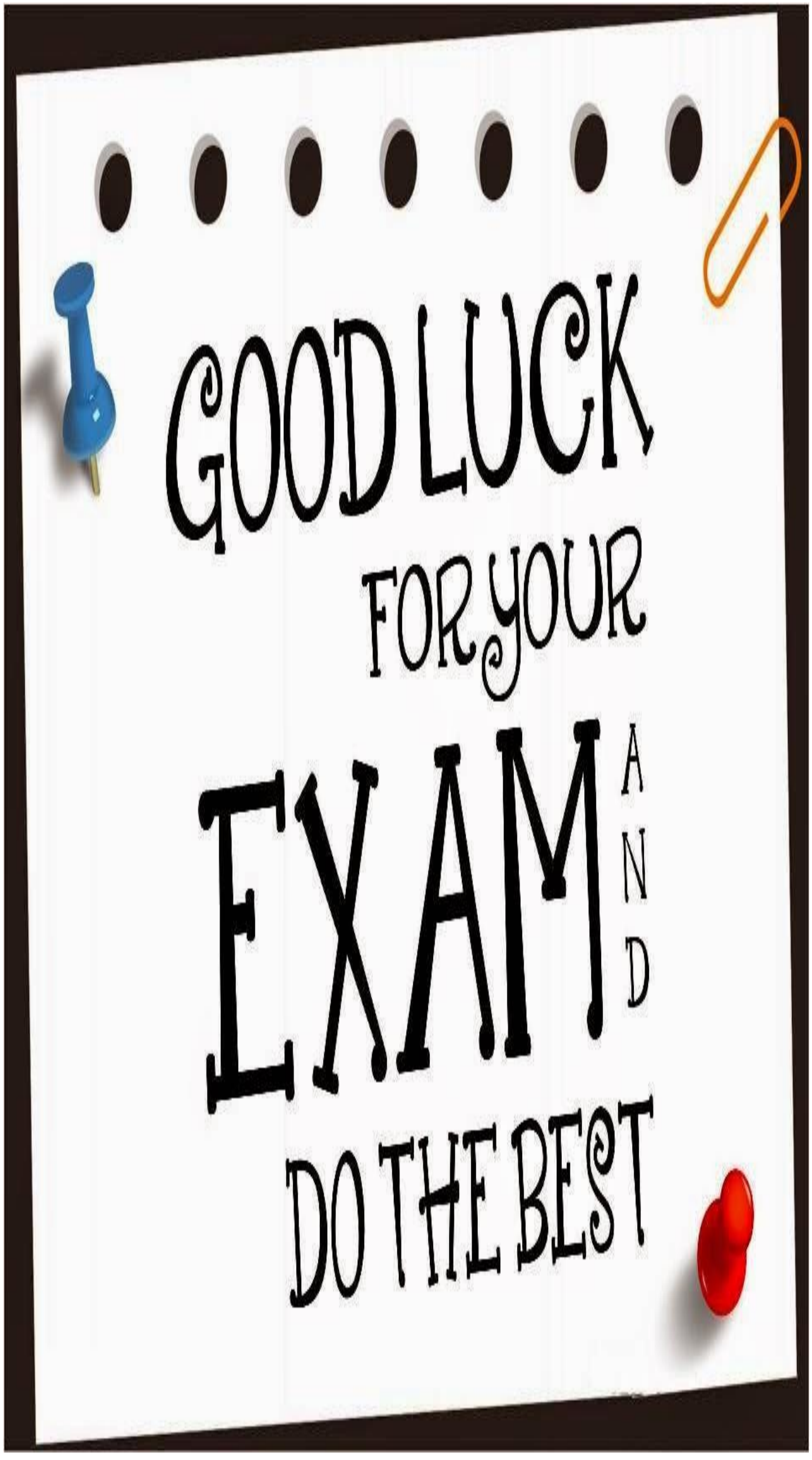
Q5. Change the car status of flat no 12 to 'Y'

Q6. Increase the count of every member by 1

```
>>> rwa['count']=rwa['count']+1
>>> rwa
            name  count car      phone
11  Monika verma      2   Y  9811451125
12  Piyush Goyal      5   Y  8089789899
13     Raima sen      3   Y  7890675645
14   Parth Gupta      4   Y  9811345678
15     Arun Dang      5   N  9092887654
16   Manan Mehta      6   Y  8900768695
```

```
>>> rwa.drop(13)
            name  count car      phone
11  Monika verma      1   Y  9811451125
12  Piyush Goyal      4   N  8089789899
14   Parth Gupta      3   Y  9811345678
15     Arun Dang      4   N  9092887654
16   Manan Mehta      5   Y  8900768695
>>> rwa.drop(axis=0,labels=[13])
            name  count car      phone
11  Monika verma      1   Y  9811451125
12  Piyush Goyal      4   N  8089789899
14   Parth Gupta      3   Y  9811345678
15     Arun Dang      4   N  9092887654
16   Manan Mehta      5   Y  8900768695
```

```
>>> rwa.loc[12,'car']='Y'
>>> rwa
            name  count car      phone
11  Monika verma      1   Y  9811451125
12  Piyush Goyal      4   Y  8089789899
13     Raima sen      2   Y  7890675645
14   Parth Gupta      3   Y  9811345678
15     Arun Dang      4   N  9092887654
16   Manan Mehta      5   Y  8900768695
```


GOOD LUCK
FOR YOUR
EXAM
AND
DO THE BEST