



**Series 3HKP3B/C**



**SET~4**

**Roll No.**

**Code No. 90**

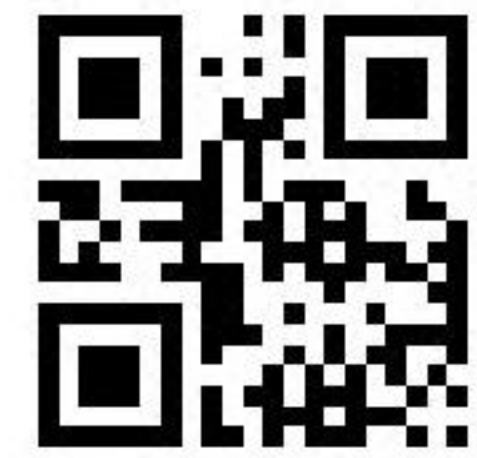
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Candidates must write the Code on the title page of the answer-book.

**NOTE :**

- (i) Please check that this question paper contains **12** printed pages.
- (ii) Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- (iii) Please check that this question paper contains **40** questions.
- (iv) Please write down the serial number of the question in the answer-book before attempting it.
- (v) 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.

**INFORMATICS PRACTICES (NEW)**



*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 has **two** 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 subparts. An examinee is to attempt any **4** out of the 5 subparts.
- (iv) Part B is Descriptive Paper.





(v) *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. 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 \_\_\_\_\_ . 1

- (A) Copyright
- (B) Hacking
- (C) Plagiarism
- (D) Trademark

2. Which Python package is used for 2D graphics ? 1

- (A) matplotlib.pyplot
- (B) pyplot.lib
- (C) matplotlib.py
- (D) matplotlib.plt

3. Write the output of the following SQL command : 1

`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 ?

1

```
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 ?

1

(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.

1

(A) line chart

(B) bar graph

(C) histogram

(D) None of the above

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

1

(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 ? 1
- (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. 1
- (A) single value
  - (B) multiple values
  - (C) no value
  - (D) None of the above
10. Which of the following is a web browser ? 1
- (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 ? 1
- (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: 1
- (A) Proprietary
  - (B) Open Source
  - (C) Experimental
  - (D) Shareware
13. What will be the output of the Python program ? 1
- ```
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 : 1
- (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. 1
- (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. 1
- (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 ? 1
- (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. 1
19. The SQL string function that returns the index of the first occurrence of substring is \_\_\_\_\_. 1
20. What is the type of network for long distance communication ? 1
- (A) LAN  
(B) MAN  
(C) WAN  
(D) PAN
21. \_\_\_\_\_ helps to enhance the functionality of the web browsers. 1
- (A) Extension  
(B) Plugin  
(C) Add-on  
(D) All of the above





## SECTION II

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

22. Consider the following DataFrame 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])
```

(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))`

(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)`

(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])`





- (iv) Which of the following commands is used to remove the column 'Age' in the DataFrame df ? 1
- (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)
- (v) Which of the following command would rename the column 'marks' to 'Term1' in the DataFrame df ? 1
- (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 | Room_type | Price | Star |
|----------|---------------|----------|-----------|-------|------|
| H001     | The Palace    | Delhi    | Deluxe    | 4500  | 5    |
| H002     | The Resort    | Mumbai   | Deluxe    | 8000  | 7    |
| H003     | Adobe Resort  | Dubai    | Villa     | 2750  | 7    |
| H004     | Victoria Hill | London   | Duplex    | 10000 | 3    |
| H005     | The Bee       | London   | Villa     | 30000 | 7    |

- (i) Display the details of all the Hotels situated in London. 1
- (ii) Display the details of all 'Deluxe' rooms with price more than 6000 in ascending order of Price. 1
- (iii) Display the Hotel names that end with "e". 1
- (iv) Count different types of rooms available in the Hotels. 1
- (v) Display the Hotel names in descending order. 1

**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. 2

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. 2

**OR**

(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. 2



26. Discuss the purpose of count(\*) function with the help of a suitable example. 2
27. Consider the following two series 'A' and 'B' : 2  
 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 : 2

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 : 2  
 (i) SELECT SUBSTR ("Innovation",3,4);  
 (ii) SELECT RIGHT ("Innovation",5);  
**OR**  
 (b) Find the output of the following SQL queries : 2  
 (i) SELECT INSTR ("COVID-19", "v");  
 (ii) SELECT MOD(5,2);
30. Consider the following DataFrame 'stu' :

|   | Admno | Firstname | Lastname | Age | Pretest | Posttest |
|---|-------|-----------|----------|-----|---------|----------|
| 0 | 1001  | Amit      | Sehgal   | 18  | 87      | 67       |
| 1 | 1002  | Rohit     | Malik    | 17  | 89      | 78       |
| 2 | 1003  | Shyam     | Bhatia   | 18  | 90      | 84       |
| 3 | 1004  | Manan     | Gupta    | 16  | 79      | 69       |
| 4 | 1005  | Raman     | Bajaj    | 18  | 92      | 70       |

- Write the statements for the DataFrame "stu" : 2  
 (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. 2







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 ? 2
33. Expand URL. Explain URL with the help of an example. 2

**SECTION II**

34. Create a series S1 with the values (2,3,1). 3  
Find the output of the following two statements considering the above created series :

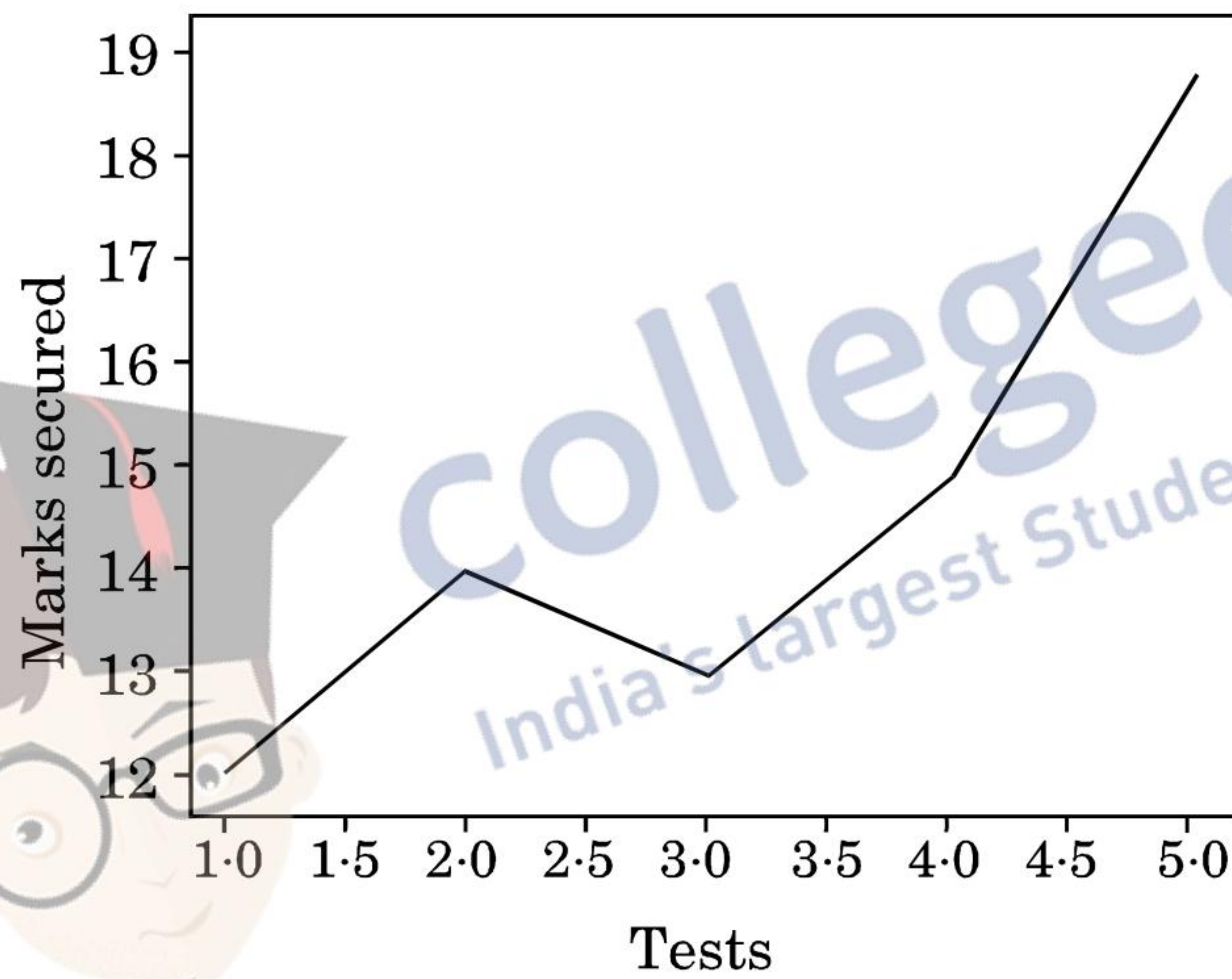
- (a) `print(S1**3)`  
(b) `print(S1*3)`

35. (a) What is the difference between Copyright and Licenses ? 3

**OR**

- (b) What do you understand by Intellectual Property Rights ? Why is there a need to protect Intellectual Property Rights ? 3

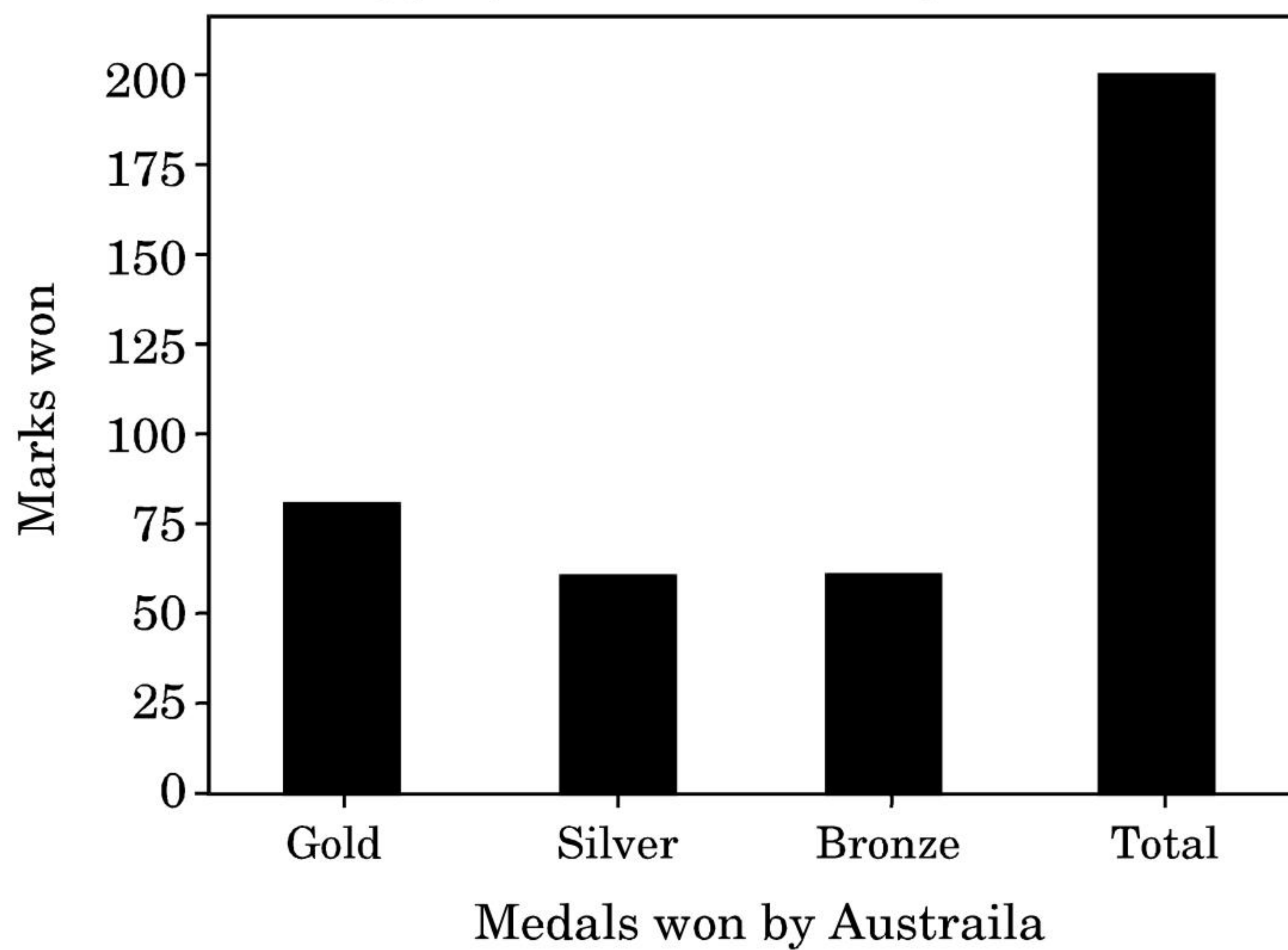
36. (a) Consider the following graph. Write the code to plot it. Also label the X and Y axis. 3



**OR**

- (b) Write code to draw the following bar graph representing the total number of medals won by Australia. 3

**AUSTRALIA MEDAL PLOT**





**Questions for visually impaired students only :**

(a) What is Data Visualization ? Discuss briefly. Also mention the name of one of the most commonly used Python library for data visualization. 3

**OR**

(b) Mention the purpose of the following functions briefly : 3

- (i) plot()
- (ii) show()
- (iii) savefig()

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

Table : **School**

| Admno    | Name           | Class | House  | Percentage | Gender |
|----------|----------------|-------|--------|------------|--------|
| 20150001 | Abhishek Kumar | 10    | Green  | 86         | Male   |
| 20140212 | Mohit Bhardwaj | 11    | Red    | 75         | Male   |
| 20090234 | Ramandeep Kaur | 10    | Yellow | 84         | Female |
| 20130216 | Mukesh Sharma  | 9     | Red    | 91         | Male   |
| 20190227 | Rahil Arora    | 10    | Blue   | 70         | Male   |
| 20120200 | Swapnil Bhatt  | 11    | Red    | 64         | 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.

**SECTION III**

**38.** (a) Write a program in Python Pandas to create the following DataFrame "population" from a Dictionary : 5

|    | 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 :

5

- (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**

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

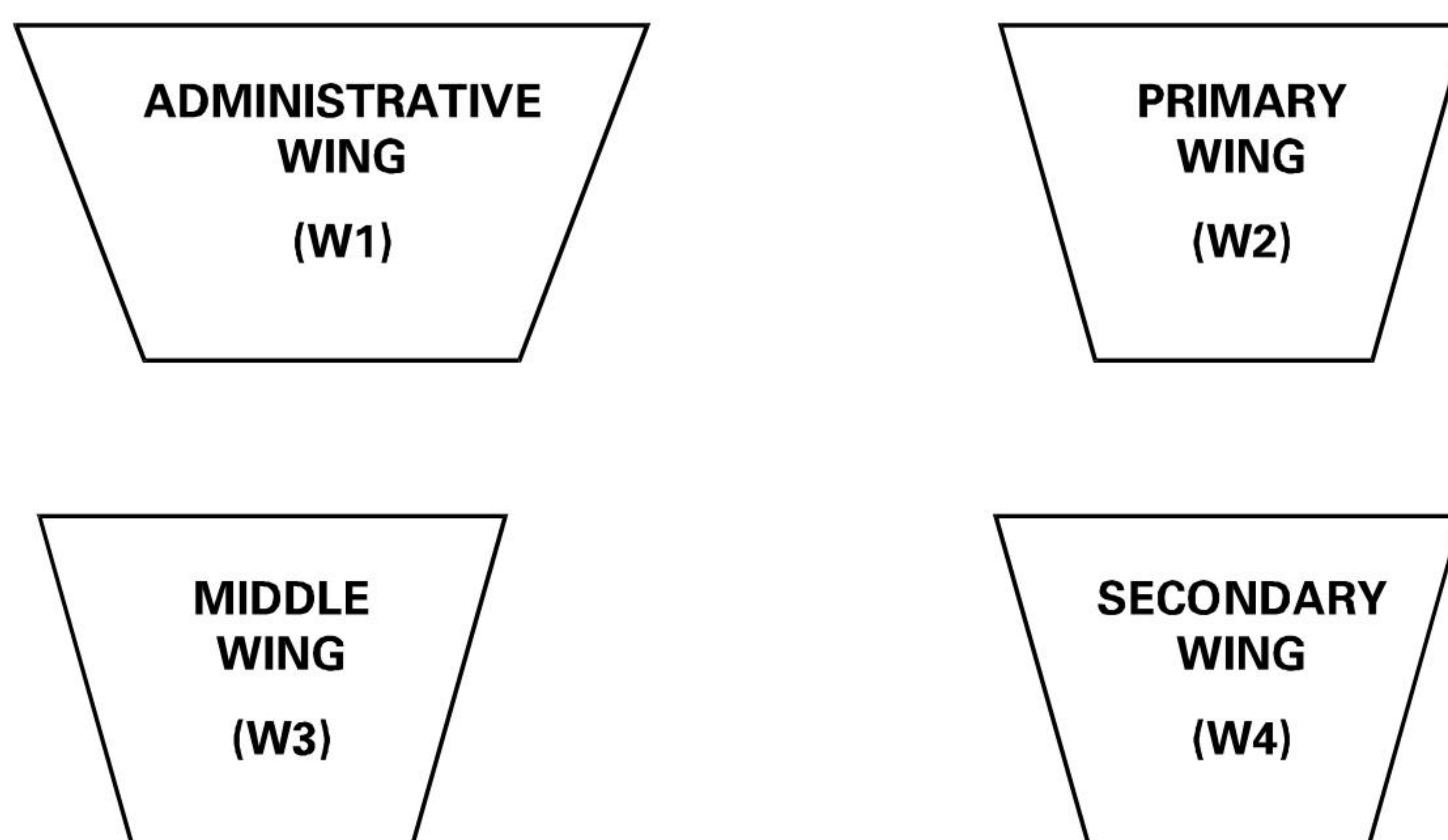
| S.No. | Itemname        | Type         | Stockdate  | Price     | Discount |
|-------|-----------------|--------------|------------|-----------|----------|
| 1     | Eating Paradise | Dining Table | 19-02-2002 | 11500.58  | 25       |
| 2     | Royal Tiger     | Sofa         | 22-02-2002 | 31000.67  | 30       |
| 3     | Decent          | Office Table | 01-01-2002 | 25000.623 | 30       |
| 4     | Pink Feather    | Baby Cot     | 20-01-2001 | 7000.3    | 20       |
| 5     | White Lotus     | Double Bed   | 23-02-2002 | NULL      | 25       |

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

5

- (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 :

|    |     |
|----|-----|
| W1 | 125 |
| W2 | 40  |
| W3 | 42  |
| W4 | 60  |

Based on the above information, answer the following questions :

5

- Suggest the most suitable cable layout for the above connections.
- In which wing would you place the server ? Explain the reason for your selection.
- Suggest the kind of network required (out of LAN, MAN, WAN) for connecting Administrative Wing and Middle Wing.
- Suggest the placement of the following devices with justification :
  - Repeater
  - Switch/Hub
- 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.

**Questions for visually impaired students only :**

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

5

- What is the significance of a switch in a computer network ?
- Mention the name of any two network topologies.
- What is MODEM ?
- Explain Gateway briefly.
- Expand VoIP.

