XII – IP – COMPARTMENT PAPER 2024

1. What does a modem do at the sender's end ?
(A) It converts analog signals into digital data.
(B) It converts digital data into analog signals.
(C) It converts digital data into optical signals.
(D) It converts optical signals into digital data.

2. Which out of the following cannot be included in digital footprint ?
(A) Submitting the form online
(B) Searching for your friend's address online
(C) Walking on the beach
(D) Online shopping

3. Emma is a student working on her research project. She finds a well-written paragraph on the Internet that perfectly explains the concept that she wants to include in her project. She copies and pastes the paragraph as it is into her research paper. Her research paper did not get selected due to plagiarism. What is the one way out of the following that Emma could have followed to avoid plagiarism in this case ?
(A) Copying the content from a book in her college library.
(B) Rewriting the paragraph in her own words and citing the original source.
(C) Asking her friends for information and using it in her research
paper, without mentioning her friend's input.
(D) Posting the paper on her college website.

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

SELECT MOD (5, 15);

(A) 10 (B) 3 (C) 0 (D) 5

5. Which of the following aggregate function returns the average of values in a specified column of a MySQL table ?
(A) AVG(Column) (B) AVERAGE(Column)
(C) MEAN(Column) (D) TOTAL(Column)

6. For how long does a patent typically protect an invention ?
(A) 5 years (B) 10 years
(C) 20 years (D) 50 years

7. In Pandas library of Python, a one-dimensional array containing a sequence of values of any datatype is known as :
(A) DataFrame (B) Histogram
(C) Series (D) Panel

8. Now() in MySQL returns _____.
(A) Today's date
(B) Today's date and current time
(C) System's date and time
(D) Name of active database

9. What will be the output of the following query ?

SELECT SUBSTR("Swachh Survekshan",2,4)

(A) wac (B) wach (C) shan (D) achh

10. What will be the output of the following Pythan code ?

```
import pandas as pd
dd={'Jan':31,'Feb':28,'Mar':31,'Apr':30}
rr=pd.Series(dd)
print(rr)
```

(A)
```
Jan 31
Feb 28
Mar 31
Apr 30
dtype: int64
```

(B)
```
Jan Feb Mar Apr
 31  28  31  30
dtype: int64
```

(C)
```
Jan – 31
Feb – 28
Mar – 31
Apr – 30
dtype: int64
```

(D)
```
Jan  Feb  Mar  Apr
 |    |    |    |
31   28   31   30
dtype: int64
```

11. With respect to databases, a row in a relation is also known as a/an _____.
(A) Attribute (B) Tuple
(C) Field (D) Domain

12. Which of the following command is used to display first three rows of a DataFrame 'DF' ?
(A) DF.head() (B) DF.header()
(C) DF.head(3) (D) DF.Head(3)

13. Which of the following Internet services is used for instant messaging ?
(A) Chat (B) Email
(C) WWW (D) Python

14. What is the output of the following SQL Query ?

SELECT INSTR("KNOWLEDGE","E");

(A) 7 (B) 5 (C) 6 (D) – 6

15. Which of the following is not a feature of Open Source Software ?
(A) It can be shared with others without any licensing burden.
(B) It is same as free software.
(C) It can be downloaded on multiple devices.
(D) Its source code is available for free distribution.

16. What is a common symptom of extended use of digital devices these days ?
(A) Improved eyesight
(B) Enhanced physical fitness
(C) Eye strain
(D) Increased muscle strength

17. Assertion (A) : Hacking is a cyber crime.
Reason (R) : To avoid hacking, one should not share the password with anyone.
(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.

18. Assertion (A) : The Pandas library in Python is primarily used for creating static, animated and interactive 2D plots or figures.
Reason (R) : Data visualization can be achieved with the help of a variety of charts and plots, including static plots, animations, and interactive visualizations.
(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.

ANSWERS

1.b	2.c	3.b	4.d	5.a	6.c
7.c	8.c	9. b	10.a	11.b	12.c
13.a	14.c	15.b	16.c	17.b	18.d

19. (a) Write one function each for the following network devices :
(i) MODEM (ii) Router
Ans) (i) Modem converts digital signals into analog signals and vice-versa.
(ii) Router receives data,analyzes it and transmits it to the destination through the best possible route.

OR

(b) Write any one advantage and any one disadvantage of BUS topology
A) Advantage:
It is relatively inexpensive to implement.
It is easy to expand. New devices can be added to the network by connecting them to the central cable.
It is easy to troubleshoot.

Disadvantage:
If the central cable fails, the entire network will be down.
Since the whole transmission occurs through a central cable, there is a possibility of data collision in the network.
The number of devices that can be connected to a bus topology is limited.
It is difficult to isolate a problem.

20. The Python code written below has syntactical errors. Rewrite the correct code and underline the correction(s) made.

```
import Pandas as pd
countries=[{'country';'INDIA','capital':'New
Delhi'}, {'country':'USA','capital':'New York'},
   {'country':'JAPAN','capital':'Tokyo'}
df=pd.DataFrame(country)
print(df)
```

A)

```
import pandas as pd
countries=[{'country':'INDIA','capital':'New
Delhi'}, {'country':'USA','capital':'New York'},
{'country':'JAPAN','capital':'Tokyo'}]
df=pd.DataFrame(countries)
print(df)
```

21. Consider the string 'PAINTING'. Write the SQL commands to display the following output :
(i) ING (ii) INT
A) **(i)** SELECT RIGHT('PAINTING',3);

OR

SELECT SUBSTR('PAINTING',6,3);

OR

SELECT SUBSTRING('PAINTING',6,3);

OR

SELECT MID('PAINTING',6,3);

(ii) SELECT SUBSTR('PAINTING',3,3);

OR

SELECT SUBSTRING('PAINTING',3,3);

OR

SELECT MID('PAINTING',3,3);

22. Find the output of the following Python code :

```
import pandas as pd
vaccine_qty=pd.Series([10,16,1],index=["Typhoid",
"Tetanus","Hepatitis"])
cost=pd.Series([200,500,800],index=["Typhoid","
Tetanus", "Flu"])
print(vaccine_qty + cost)
```

Ans)

```
Flu          NaN
Hepatitis    NaN
Tetanus      516.0
Typhoid      210.0
dtype: float64
```

23. Define the following terms : 2

(i) Web Hosting (ii) WWW

A) (i) Web hosting is a service that provides storage for a website's files and network infrastructure that makes the website available on Internet.

(ii) The **World Wide Web** (WWW) is an interconnected network of web pages and documents accessible through the Internet.

24. Consider the following Python code : 2

```
import pandas as pan
customer=[{'Name':'Alisha','Age':25,'Gender':'Female', 'Occupation':'Engineer'},
{'Name':'Rozer','Age':34,'Gender':'Male',_____:'Analyst'}, 'Name':'Fazal','Age':28,'Gender':'Male', 'Occupation':'Developer'}]
df= _____.DataFrame(_____)
print(_____)
```

Complete the above given Python code to display the following output

	Name	Age	Gender	Occuptaion
0	Alisha	25	Female	Occupation
1	Rozer	34	Male	Engineer
2	Fazal	28	Male	Developer

Ans)

```
import pandas as pan
customer=[{'Name':'Alisha','Age':25,'Gender':'Female', 'Occupation':'Engineer'}, {'Name':'Rozer', 'Age':34,'Gender':'Male','Occupation': 'Analyst'}, {'Name':'Fazal','Age':28,'Gender':'Male', 'Occupation':'Developer'}]
df= pan.DataFrame(customer)
print(df)
```

25. Write any two differences between DELETE and DROP TABLE command of MySQL.

A)

DELETE	DROP TABLE
It removes some or all rows from a table.	It removes the complete table.
It doesn't remove the table structure.	It removes the table structure.
It is a DML command.	It is a DDL command.
It can be used with 'WHERE' clause	It cannot be used with 'WHERE' clause

SECTION C

26. Consider the table BIKES given below :

Table : **BIKES**

Bid	Bikename	Brandname	Biketype	Cost
1001	Dream Racer	Speedo	Super	1980000
1002	Splendid	Indiana	NULL	50000
1003	Silver Wing	Indiana	Touring	2300000
1004	ZZZZ	WMV	Sports	1500000
1005	CH2H	Speedo	Super	470000
1006	Astor	Victory	Normal	1700000
1007	CHANDRA	WMV	Adventure	3000000
1008	SWISS	WMV	Touring	4200000
1009	SWIFT	ROADY	Super	1900000
1010	CLOUD9	GEM	Normal	1700000

(a) Write SQL commands for the following :

(i) Display Bikenames and their corresponding Brandnames in descending order of cost.

A) SELECT Bikename, Brandname FROM BIKES ORDER BY Cost DESC;

(ii) Display Brandnames of bikes whose Biketype is not known.

A) SELECT Brandname FROM BIKES WHERE Biketype IS NULL;

(iii) Consider the following query :

SELECT*FROM BIKES WHERE Cost BETWEEN 200000 AND 3000000;

Write another query, using relational and logical operators which will produce the same output.

A) SELECT * FROM BIKES WHERE Cost >= 200000 AND Cost<=3000000;

OR

(b) Predict the output of the following queries based on the table BIKES given above :

(i) SELECT UCASE(TRIM(Brandname)) FROM BIKES WHERE Bid = 1003;

(ii) SELECT COUNT(Biketype) FROM BIKES;

(iii) SELECT SUM(Cost), Brandname FROM BIKES GROUP BY Brandname Having Brandname = "WMV" OR Brandname = "Indiana";

A)

(i) INDIANA

(ii) 9

(iii)

SUM(Cost)	Brandname
2350000	Indiana
8700000	WMV

27. Sejal, a Python programmer has been given the following tasks :

(i) Create two series – one to store various product names and the other to store the corresponding price.

Each series should have appropriate row label as given below :

	Product_name	Product_price
B1001	Butterscotch	130
V3002	Vanilla	100
M4002	Mango Zap	150
M4007	Magnum	190
C6005	Cassatta	200

A)
```
import pandas as pd
D1=['Butterscotch','Vanilla','Mango
Zap','Magnum','Cassatta']
D2=[130,100,150,190,200]
I=['B1001','V3002','M4002','M4007','C6005']
S1=pd.Series(D1,I)
S2=pd.Series(D2,I)
```
(ii) Create a dictionary containing 'Product_name' and 'Product_price' as keys. Add the series created in part (i) as their corresponding values.
A) D={'Product_name':S1,'Product_price':S2}

(iii) Create a DataFrame from the above created dictionary of series.
Help her in writing the Python program to accomplish the above mentioned tasks.
A) DF=pd.DataFrame(D)

28. Answer the following questions based on the table Sales given below :

Table : **Sales**

id	Name	City	Commission
E001	Naman Batra	Chandigarh	20
E002	Rupesh Mann	Delhi	15
E005	Ravi Gautam	Mumbai	25
E006	Mukul Singh	Delhi	30
E007	Ruby Rai	Mumbai	19
E003	Raman Roy	Kolkata	16

(i) Suggest the Primary key for the given table ?
A) id
(ii) Write the SQL command to insert the following data in the table Sales :
id □E009
Name □ Sukumar
City □Nagpur
Commission □10
A)
```
INSERT INTO Sales
VALUES('E009','Sukumar','Nagpur',10)
```
OR
```
INSERT INTO Sales
VALUE('E009','Sukumar','Nagpur',10)
```
OR
```
INSERT INTO Sales(id, Name, City, Commision)
VALUES('E009','Sukumar','Nagpur',10)
```
OR
```
INSERT INTO Sales(id, Name, City, Commision)
VALUE('E009','Sukumar','Nagpur',10)
```

(iii) Is the command used in part (ii) a DDL or a DML command ?
A) DML

29. (a) Sarah works in a multinational IT firm. One day, she came to know that some mails were sent from her official mail account but she had not actually sent them.
Based on the given information, answer the following questions :
(i) Sarah is a victim of which type of cybercrime ?
A) Hacking

(ii) Write any two precautions that one should take to protect oneself from being the victim of cybercrime.
A)
Keep strong password(s) and change them regularly.
Do not click on any untrusted link(s)
Do not share personal information with strangers.
Always use updated Antivirus
Always use licensed software.
Lock or log off from the computer when you step away.
Use secure Wi-Fi connection

(iii) Should Sarah immediately change the password of her email account ?
A) Yes, Sarah should immediately change the password of her email account .

OR

(b) At a local electronics store, a new range of smartphones has been launched, creating a buzz among technology enthusiasts. However, the introduction of these new devices has also raised concerns about the increasing generation of e-waste in the community.
Answer the following questions based on above extract :
(i) Define e-waste.
A) E-Waste is the term used for electrical and electronic equipment and their
parts that have been discarded as waste.

(ii) Give any one environmental challenge posed by e-waste,
including its impact on air, water, and soil quality.
A) ●E-waste releases harmful pollutants into the air, contributing to air pollution and posing respiratory health risks.
● E-waste releases heavy metals in the groundwater making it toxic and unsafe for consumption.
● E-waste makes harmful chemicals leach into the soil and groundwater. These toxins persist in the soil for a long time adversely affecting ecosystems and human health.

(iii) Imagine you are a part of a local environment organization. Provide any two strategies that could be implemented to minimize the negative environmental effects of e-waste.

A) Facilitate/Encourage the reuse of electronics by promoting donation, use of second-hand /refurbished equipment, exchanges.

Promote policies and initiatives that support the right to repair electronics.

Launch educational campaigns to raise awareness about the environmental impacts of e-waste and promote Reuse, Recycle and Reduce

30. Consider the following DataFrame Cricket :

	Won	Lost	Played
A	9	11	20
B	12	5	17
C	10	6	16
D	7	7	14
E	6	6	12

Write suitable Python statements to perform the following tasks :

(i) Add a new column Rating to the DataFrame having the following values : 3, 1, 2, 4, 5

A) Cricket['Rating']=[3,1,2,4,5]

(ii) Change the row labels from A, B, C, D, E to Team A, Team B, Team C, Team D and Team E.

A) Cricket.rename(index={"A":"Team A", "B":"Team B", "C":"Team C", "D":"Team D", "E":"Team E"}, inplace=True)

(iii) Change the column label of first column from 'Won' to 'Matches won'.

A) Cricket.rename(columns={"Won":"Matches won"}, inplace=True)

SECTION – D

31. Ms. Sridevi is a placement head in a reputed engineering institute and has created the following table to store the records of students getting placement in various companies :

Table : **Placement**

Compid	Company Name	Vacancies	Appeared	Department	DoJ	City
CP01	Rising Star	20	300	Networking	2020-07-02	Bengaluru
CP02	Smoke Ring	30	350	Web Development	2019-07-12	Chennai
CP03	Pilot	15	421	Cloud	2020-08-12	Bengaluru
CP04	Jingle	10	145	Servers	2019-01-23	Hyderabad
CP05	Neel Zone	17	568	Data Analytics	2018-09-02	Bengaluru
CP06	Hard Talk	12	276	Marketing	2020-07-02	Hyderabad

Based on the given table, help Ms. Sridevi to write SQL queries for performing the following tasks :

(i) To list names of those companies where department is either Marketing or Networking.

A) SELECT CompanyName FROM Placement WHERE Department = 'Marketing' OR Department = 'Networking';

OR

SELECT CompanyName FROM Placement WHERE Department IN ('Marketing', 'Networking');

(ii) To display the joining month name for Rising Star company.

Ms. Sridevi has written following queries. Write the output of each query :

A)

SELECT MONTHNAME(DoJ) FROM Placement
WHERE CompanyName = 'Rising Star';

(iii) SELECT LEFT (CompanyName, INSTR(CompanyName,"R")) FROM Placement where vacancies >=20;

A)

LEFT (CompanyName, INSTR(CompanyName,"R"))
R
Smoke R

(iv) SELECT CompanyName FROM Placement WHERE Vacancies < 20 AND Appeared >300;

A)

CompanyName
Pilot
Neel Zone

32. Ms. Shambhavi, a data analyst working on a college admission project, has created the following DataFrame Sub_Details to store subject wise details :

	Subject	Total Students	Seat Availability
1	English	50	No
2	IT	45	Yes
3	AI	40	Yes
4	CS	50	No
5	CA	47	Yes

Help her by answering the following questions : 4

(i) Write suitable Python command to display the row having index value 3.

A) print(Sub_Details[2:3])

OR

print(Sub_Details.loc[3])

(ii) Predict the output of the following Python statement :

print(Sub_Details.loc[2:3,'Total Students'])

A) 2 45
3 40

Name: Total Students, dtype: int64

(iii) (a) Write suitable Python statement to display the list of various subjects along with their corresponding seat availability.

A) print(Sub_Details[['Subject','Seat Availability']])

OR [option for part (iii) only]

(b) Ms. Shambhavi has just created a folder named Project in the E: drive of her computer to store necessary files related to the project. Write suitable Python statement to export the given DataFrame into the file stud.csv, created inside project folder
in E: drive.

A) Sub_Details.to_csv("E:\project\stud.csv")

OR

Sub_Details.to_csv("E:/project/stud.csv")

OR

Sub_Details.to_csv("E:\\project\\stud.csv")

OR

Sub_Details.to_csv(r"E:\project\stud.csv")

SECTION – E

33. Consider the tables Faculty and Batch given below :

Table : Faculty

F_Id	FacName	DoJ	Qualification	Salary
Emp01	Neeta Khanna	2013-07-01	MCA	85000
Emp02	Sonia Chawla	2023-05-05	MA	35000
Emp03	Sheetal	2015-06-28	MSc	90000
Emp04	Bindu	2016-03-30	M.Com	80000
Emp05	Sunidhi	2002-06-28	BA	100000
Emp06	Ashish	1999-07-01	B.Com	120000

Table : Batch

Batchid	BatchName	F_Id	Daysperweek	Subjects
B01	TXAlpha	Emp01	3	English
B02	TXBeta	Emp05	5	Chemistry
B03	TXGama	Emp02	4	Physics
B04	Super30	Emp03	3	Mathematics
B05	G-20	EMp04	2	Economics
B06	LXAlpha	Emp01	4	Accountancy

Write SQL queries for the following :

(a) (i) Display name and salary of all faculties in alphabetical order of their names.

A) (i) SELECT FacName,Salary FROM Faculty ORDER BY FacName;

OR

SELECT FacName,Salary FROM Faculty ORDER BY FacName ASC;

(ii) Display details of faculties who joined on Monday.

A) SELECT * FROM Faculty WHERE DAYNAME(DoJ)='Monday';

OR

SELECT * FROM Faculty WHERE DAYOFWEEK(DoJ)=2;

(iii) Display names of faculties, their salary and BatchName from both the tables.

A) SELECT FacName, Salary, BatchName FROM Faculty, Batch WHERE Faculty.F_Id = Batch.F_Id;

OR

SELECT FacName,Salary,BatchName FROM Faculty F,Batch B WHERE F.F_Id = B.F_Id;

OR

SELECT FacName,Salary,BatchName
FROM Faculty NATURAL JOIN Batch;

(iv) Display the details of all faculties whose salary is more than 60000 and have joined before the year 2007.

A) SELECT * FROM Faculty
WHERE Salary>60000 AND YEAR(DoJ)<2007;

OR

SELECT * FROM Faculty WHERE
Salary>60000 AND DoJ<"2007-01-01";

(v) Display the name of faculty who is taking TXAlpha Batch.

A) SELECT FacName FROM Faculty, Batch WHERE BatchName = "TXAlpha" AND Faculty.F_Id = Batch.F_Id;

OR

SELECT FacName FROM Faculty, Batch WHERE Faculty.F_Id = Batch.F_Id AND BatchName = "TXAlpha";

OR

SELECT FacName FROM Faculty F, Batch B WHERE F.F_Id = B.F_Id AND BatchName = "TXAlpha";

OR

SELECT FacName FROM Faculty NATURAL JOIN Batch WHERE BatchName = "TXAlpha";

OR

(b) (i) Display maximum days per week for each F_Id from the table Batch.

A) SELECT F_Id, MAX(Daysperweek)FROM Batch GROUP BY F_Id;

(ii) Display names of faculties after removing leading and trailing spaces.

A) SELECT TRIM(FacName) FROM Faculty;

(iii) Display total number of records in the table Faculty.

A) SELECT COUNT(*) FROM Faculty;

OR

SELECT COUNT(FID) FROM Faculty;

(iv) Increase the salary by 25% of those employees whose qualification is MCA.

A) UPDATE Faculty SET Salary = Salary+(25/100)*Salary WHERE Qualification = "MCA";

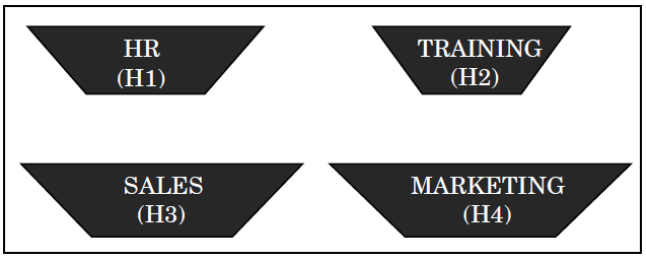
OR

```
UPDATE Faculty SET Salary = Salary*1.25
WHERE Qualification = "MCA";
```

(v) Delete the records of batches whose subject is English.

A) DELETE FROM Batch WHERE Subject = "English";

34. Classpoint Pvt. Ltd., Pune is a company that deals with development and training of software. They have different divisions HR (H1), Training (H2), Sales (H3) and Marketing (H4). The layout of the Pune branch is :



The management wants to connect all the divisions as well as all the computers of each division (H1, H2, H3 and H4).

Distance between the divisions are as follows :

H1 to H2	**90m**
H1 to H3	**145m**
H1 to H4	**88m**
H2 to H3	**110m**
H2 to H4	**80m**
H3 to H4	**160m**

Number of computers in each division :

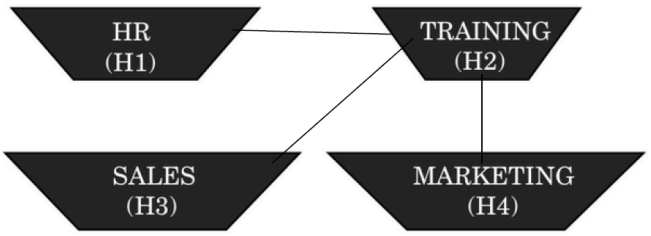
Division	Number of Computers
H1	**100**
H2	**220**
H3	**160**
H4	**140**

Based on the above specifications, answer the following questions :

(i) Suggest the topology and draw the most suitable cable layout for connecting all the divisions.

A)

STAR TOPOLOGY



(ii) Classpoint Pvt. Ltd. plans to establish a new office in Dubai. Out of LAN, MAN and WAN, what kind of network will be created to connect Pune office with Dubai office ?

A) WAN

(iii) Suggest the division for the placement of server in Pune office.
Explain the reason for your selection.

A) Server should be placed in H2 division as it has the maximum number of computers.

(iv) Suggest the placement of switch/hub with justification.

A) Switch/hub should be placed in all blocks as it is used to connect computers within each building.

(v) Ms. Abhilasha, working in Dubai office, is creating a software for conducting program for the employees of Pune branch. Which protocol would help her in voice transmission over a computer network ?

A) VOIP/Voice over Internet Protocol

35. (a) Akriti keeps the calorie count of different food items as follows :

```
Food=['Apple','Banana','Rice','Wheat','Carrot']
Calorie=[72,105,204,455,52]
```

Write a Python code to generate a Bar Chart on the given data, having suitable Chart Title and labels for X and Y axis. Also add suitable statement to save this chart with the name calorie.png.

A)

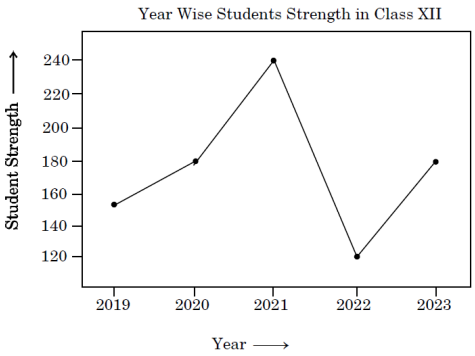
```
import matplotlib.pyplot as plt
Food=['Apple','Banana','Rice','Wheat','Carrot']
Calorie=[72,105,204,455,52]
plt.bar(Food, Calorie)
plt.title("Calorie count of different food items")
plt.xlabel("Food")
plt.ylabel("Calorie")
plt.savefig("calorie.png")
plt.show()
```

OR

(b) Consider the following data :

Year	Student Strength
2019	150
2020	180
2021	240
2022	120
2023	180

Write a Python code to draw the following line chart having title and labels for x and y axis as shown below :



Also give suitable Python statement to save this chart with name, stud.png.

A)

```
import matplotlib.pyplot as plt
Year=['2019', '2020', '2021', '2022', '2023']
Strength=[150, 180, 240, 120, 180]
plt.plot(Year, Strength)
plt.title("Year Wise Students Strength in Class XII")
plt.xlabel("Year")
plt.ylabel("Student Strength")
plt.savefig("stud.png")
plt.show()
```