BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL
PRE BOARD -01 EXAMINATION 2024-25

INFORMATICS PRACTICES (065)
MARKING SCHEME

Class : XII SCIENCE/COMMERCE/ARTS **Duration : 3 Hrs**
Date : 22-11-2024 **Max. Marks : 70**
Admission No.: **Roll No.:**

General Instructions:

Try to attempt all questions as per given order.

All questions are compulsory.

The Question Paper is divided into four sections Section A to D.

- Section A has 18 questions and carry 1 mark each.
- Section B has 10 questions and carry 2 marks each.
- Section C has 8 questions and carry 3 marks each.
- Section D has 2 questions and carry 4 marks each.

Section-A

1. How can individuals protect themselves from identity theft ? 1
(a) Share personal information freely on social media (b) Use the same password for all online accounts (c) Never check bank statements **(d)** Shred sensitive documents, use strong passwords, and monitor financial accounts

2. Which Python command can be utilized to create a histogram using the data in a list named that represents scores of students in an exam ? 1
(a) plt.hist(values) (b) seaborn.histplot(values) (c) plt.plot_histogram(values)
(d) numpy.histogram(values)

3. Which network topology typically results in less wire length usage as compared to others ? 1
(a) Star topology (b) Mesh topology **(c)** Bus topology (d) Hybrid topology

4. ____ is a cyber-attack method that involves sending fraudulent emails or messages to trick individuals into revealing sensitive information, such as login credentials or financial data ? 1
(a) Malware Infection (b) DDoS Attack **(c)** Phishing (d) SQL Injection

5. Which environmental issue is associated with electronic waste? 1
(a) Ocean Acidification (b) Air Pollution (c) Noise Pollution (d) Water Scarcity

6. To get the number of dimensions of a Series object, _____ attribute is displayed. 1
(a) Index (b) Size (c) Itemsize **(d)** Ndim

7. To iterate over horizontal subsets of dataframe, _____ function may be used. 1
(a) iterate (b) itercols **(c) iterrows**( ) (d) iteritems ( )

8. To display third element of a Series object S, you will write_____. 1
```
import pandas as pd
list1=[10,20,30,40,50]
S = pd.Series(list1)
print(S[ ])
```
(a) S[:3] **(b)** S[2] (c) S[3] (d) S[:2]

9. Which of the following command will show the last 3 rows from a Pandas Series named NP? 1
(a) NP.Tail( ) (**b) NP.tail(3)**
(c) NP.TAIL(3) (d) All of the above

10. Assertion **(A)** Cookies are small text files stored locally by the client's web browser to remember the "name value pair" that identifies the client. 1
Reason **(R)** Cookies are primarily used to track users' physical locations.
(a) Both A and R are true and R is the correct explanation for A
(b) Both A and R are true but R is not the correct explanation for A
(c) A is True but R is False
(d) A is false but R is True

11. In SQL, which of the following will select only one copy of each set of duplicate rows from a table. 1
(a) SELECT UNIQUE **(b) SELECT DISTINCT** (c) SELECT DIFFERENT (d) All of these.

12. Which of the following functions returns the substring from a given string ? 1
(a) Mid (b) Instr (c) Char (d) All of these

13. What will be returned by the given query ? 1
Select round(153.669,2);
(a) 153.6 **(b) 153.67** (c) 153.66 (d) None of these

14. Assertion (A)Python Pandas library offers functionality to interact with a CSV file. 1
Reasoning(R)Pandas read_csv( ) and to_csv( ) functions can read-from and write-to CSV files.
(a) Both A and R are true and R is the correct explanation for A
(b) Both A and R are true but R is not the correct explanation for A
(c) A is True but R is False
(d) A is false but R is True

15. Identify FOSS from the following: 1
(a) MS Windows (b) CorelDraw (c) Photoshop **(d) Linux**

16. Which SQL function is used to count the number of rows in a SQL query ? 1
(a) Number **(b) Count(*)** (c) Sum( ) (d) Count( ) (e) All of these

17. To create summary results, _____ clause is used. 1
(a) Sort by (b) Summary by **(c) Group by** (d) Order by

18. In which type of join, the join condition contains an equality operator ? 1
(a) Equijoin (b) Natural (c) Left Join (d) Right Join

Section- B

19. Rashi has just started using internet. Mention her any four net etiquette which she should follow in order to become a good netizen.
OR 2
Mention any four communication etiquette which one should follow while communicating on the internet.

Ans: No copyright violation. Share your expertise with others on the internet. Avoid cyberbullying. Respect others' privacy and diversity.

Or
Make sure identification is clear in all communications.
Review what you wrote and try to interpret it objectively.
If you wouldn't say it face to face, don't say it online.
Don't assume everyone understands where you're coming from.
Don't spam.
Use emoticons.
Respect others' privacy.
Remember, if it's on the internet, it's everywhere.
Follow the rules.
Forgive and forget.

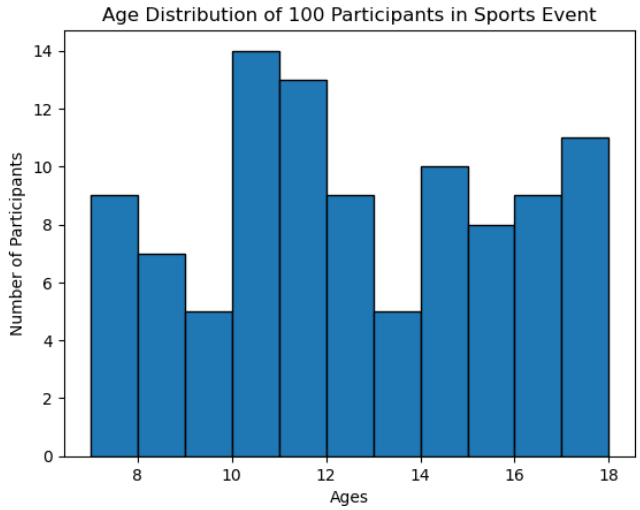
20. Given dataframe 'Product', Write the python code for the following: 2

	Item	Company	Rupees	USD
0	Laptop	Dell	50000	600
1	Smartphone	Apple	75000	900
2	Tablet	Samsung	30000	360
3	Headphones	Sony	15000	180

a) To add a new row in the above dataframe. (Values: AC, DAIKIN,15000,800)
b) To display the sum of all Products.

Ans: a) product.loc[4,:] =['AC','DAIKIN',15000,800]
b) product.sum()

21. Create a histogram of the given data. It shows participants of students between the age bracket of 7 and 18. 2



Ans:
```
employee1 = {'ename': 'Alice', 'ecode': 'E101'}
employee2 = {'ename': 'Bob', 'ecode': 'E102'}
employee3 = {'ename': 'Charlie', 'ecode': 'E103'}
employee4 = {'ename': 'David', 'ecode': 'E104'}
# Creating a dictionary with 'ename' and 'ecode' keys
```

```
employee_dict = {    'employee1': {'ename': employee1['ename'], 'ecode': employee1['ecode']},
'employee2': {'ename': employee2['ename'], 'ecode': employee2['ecode']},    'employee3':
{'ename': employee3['ename'], 'ecode': employee3['ecode']},    'employee4': {'ename':
employee4['ename'], 'ecode': employee4['ecode']}
}
# Print the resulting dictionary
print(employee_dict)
```

22. Choose the most appropriate wireless communication channel in each of the following situations : 2

(i) Communication in hilly area.

(ii) Very fast communication between two offices in two different countries.

OR

Define the term hub. Also explain the brief active hubs and passive hubs.

Ans: (i) A wireless communication channel that is suitable for non-line-of-sight scenarios would be ideal. In such cases, radio frequency communication using technologies like Zigbee or LoRa (Long Range) might be appropriate.

(ii) A high-speed and reliable wireless communication channel is needed. In this scenario, a dedicated high-speed broadband connection, such as a fiber optic link, might be the most appropriate. Fiber optic cables can transmit data at extremely high speeds and are known for low latency, making them suitable for fast and reliable communication between distant locations. Satellite communication can also be considered, but it often has higher latency compared to fiber optics. The choice may depend on factors like cost, availability, and specific communication requirements.

OR

A hub refers to a basic networking device that connects multiple devices in a local area network (LAN).

Active Hub:

An active hub, also known as a "powered hub," includes repeaters and signal regeneration capabilities.

Passive Hub:

A passive hub, also known as an "unpowered hub" or "dumb hub," does not require an

23. Differentiate between iterrows( ) and iteritem( ) function with example. 2

Ans:

iterrows()	iteritems()
Iterates over **rows** of the DataFrame.	Iterates over **columns** of the DataFrame.
Returns (index, Series) pairs.	Returns (column name, Series) pairs.
Each row is represented as a Pandas Series.	Each column is represented as a Pandas Series.
Slower when working with large DataFrames.	Generally faster when iterating through columns.
Used for row-wise operations.	Used for column-wise operations.

```
for index, row in df.iterrows():
    print(f"Index: {index}")
    print(f"Name: {row['Name']}, Marks: {row['Marks']}, Subject: {row['Subject']}")
for column, data in df.iteritems():
    print(f"Column: {column}")
    print(f"Data:\n{data}")
```

24. Predict the output of the following queries : 2
i. SELECT INSTR(RIGHT('EXAM@2022', '2');
ii. SELECT MID('KENDRIYA VIDYALAYA',10,5);
OR
Write any two Date/Time Function in SQL with proper example ?

Ans: i) 22 ii) VIDYA
OR
DATE_FORMAT Function (MySQL):
SELECT DATE_FORMAT(NOW(), '%Y-%m-%d %H:%i:%s') AS formatted_datetime;

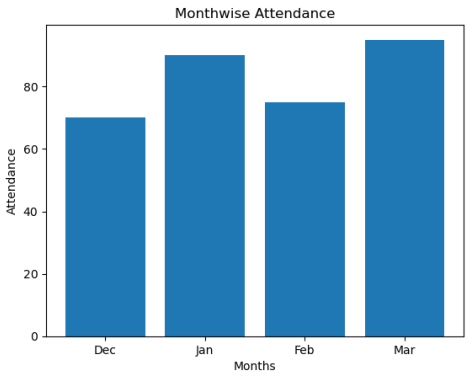
25. Write SQL queries to do the following function: 2
(a) To add a new column "Aadhar_Number" datatype varchar(16) in a table "STUDENT".
(b) To remove a column "Middle_Name" from a table "STUDENT".

Ans: (a) ALTER TABLE STUDENT ADD Aadhar_Number VARCHAR(16);
(b) ALTER TABLE STUDENT DROP COLUMN Middle_Name;

26. Write a SQL query to display the number of employees with same job ? 2
Note: Table Name:- Employee, Fields : Job

Ans: Select JOB, count(*) "No_of_Employees" from Employee group by job;

27. Write the output from the given python code : 2
```
import matplotlib.pyplot as plt
Months=['Dec',' 'Jan', ,'Feb','Mar']
Attendance=[70,90,75,95]
plt.bar(Months, Attendance)
plt.xlabel("Months")
plt.ylabel("Attendance")
plt.title("Monthwise Attendance")
plt.show()
```



28. Predict the output of following code fragments. For every next code fragment, consider that the changes by previous code fragment are in place. That is, for code fragment (b), changes made by code fragment (a) are persisting; for (c), changes by (a) and (b) are persisting and so on. 2

(a) import pandas as pd
columns=['2015','2016','2017','2018']
index=['Messi','Ronaldo','Neymar','Hazard']
df=pd.DataFrame(columns=columns,index=index)
print(df)
df.to_csv("c:\\one.csv")
(b)
df['2015']['Messi']=12
df['2016','Ronaldo']=11
df['2017']['Neymar']=8
df['2018']['Hazard']=16
print(df)
df.to_csv("c:\\two.csv",sep='@')

(a)

	2015	2016	2017	2018
Messi	NaN	NaN	NaN	NaN
Ronaldo	NaN	NaN	NaN	NaN
Neymar	NaN	NaN	NaN	NaN
Hazard	NaN	NaN	NaN	NaN

(b)

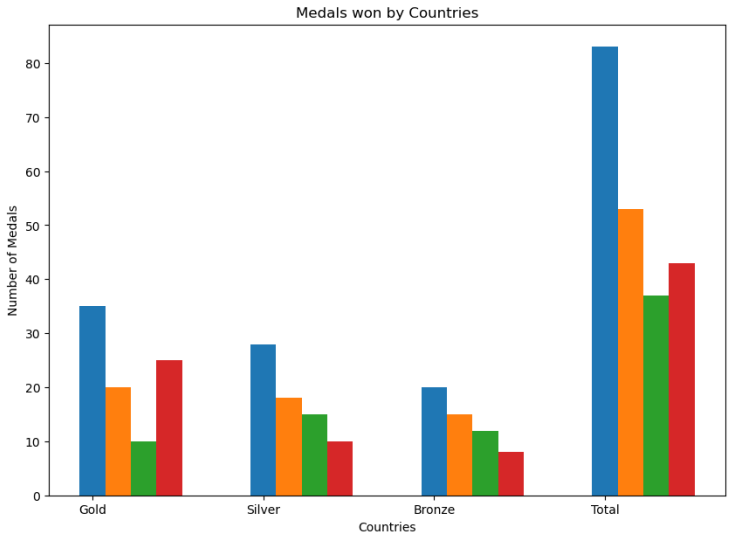
	2015	2016	2017	2018
Messi	12	NaN	NaN	NaN
Ronaldo	NaN	11	NaN	NaN
Neymar	NaN	NaN	8	NaN
Hazard	NaN	NaN	NaN	16

Section-C

29. Consider the given SQL QUERIES and write only the SQL function name: 3
(i) To retrieve the length of the given string "CBSE BOARD SQP 2024!".
(ii) To find out if **symbol** @ is present in the values of email id column or not.
(iii) To display the name of month in which you were born.

Ans: (i) length() function, (ii) Instr() function (iii) Month()

30. Write a python program to create a multiple bar charts as given below: 3
Countries representing in order (1 : Australia, 2: England, 3: India, 4: China) for each medal.



```
import matplotlib.pyplot as plt
import numpy as np
plt.figure(figsize=(10,7))
info = ['Gold', 'Silver', 'Bronze', 'Total']
Australia= [35, 28, 20, 83]
England = [20, 18, 15, 53]
India= [10, 15, 12, 37]
China= [25, 10, 8, 43]
# Creating the x-axis positions for each country
x = np.arange(len(info))

plt.bar(info,Australia,width=.15)
plt.bar(x+0.15,England,width=.15)
plt.bar(x+0.30,India,width=.15)
plt.bar(x+0.45,China,width=.15)
plt.xlabel('Countries')
plt.ylabel('Number of Medals')
plt.title('Medals won by Countries')
plt.xticks(x)
plt.show()
```

31. Write a SQL command to create a table “VEHICLES” . Identify Primary Key and Not Null. 3

```
+------------+---------------+------+-----+---------+
| Field      | Type          | Null | Key | Default |
+------------+---------------+------+-----+---------+
| Vehicle_No | varchar(20)   | NO   | PRI | NULL    |
| Type       | varchar(50)   | YES  |     | NULL    |
| Company    | varchar(50)   | YES  |     | NULL    |
| Price      | decimal(10,2) | NO   |     | NULL    |
| Qty        | int           | YES  |     | NULL    |
+------------+---------------+------+-----+---------+
```

Ans: CREATE TABLE Vehicle (Vehicle_No VARCHAR(20) PRIMARY KEY,
Type VARCHAR(50), Company VARCHAR(50), Price DECIMAL(10, 2) NOT NULL,
Qty INT);

32. What is the purpose of GROUP BY clause in MySQL? How is it different from ORDER BY clause? 3

Ans. The GROUP BY clause is used to group rows based on the values of one or more columns. It is often used in conjunction with aggregate functions such as SUM, COUNT, AVG, etc., to perform calculations on each group of rows.

The ORDER BY clause is used to sort the result set of a query based on one or more columns, either in ascending (ASC) or descending (DESC) order.

33. Imagine a scenario where an individual, Alex, is concerned about his online privacy. Alex has a social media presence and frequently posts updates, photos, and comments on various platforms. Additionally, Alex frequently uses mobile apps and visits websites for shopping and information. 3

a. Explain the concept of an active digital footprint, providing examples from Alex's online activities.

b. Describe the concept of a passive digital footprint and provide examples of how it is generated in Alex's online interactions.

c. Discuss the implications of both active and passive digital footprints for Alex's online privacy and security.

OR

With reference to 3R's, describe three essential approaches to manage electronic waste. Also, provide practical examples of how individuals can actively participate in each approach.

Ans. An active digital footprint refers to the intentional and voluntary information that an individual consciously shares or leaves online through their activities on various digital platforms. In the case of Alex, who is concerned about online privacy, his active digital footprint is the data he knowingly contributes to the digital realm.

Alex actively maintains social media profiles on platforms like Facebook, Twitter, and Instagram. Examples:

Alex uses a fitness app that tracks his daily runs, storing information about his route, distance, and speed.

Alex participates in a tech forum, offering advice to others on a specific software-related issue.

b. A passive digital footprint refers to the data trail left by an individual without their direct, intentional input. Examples: Cookies and Tracking Pixels, Search Engine Queries,Social Media Analytics,Location Tracking,Online Advertisements etc

c. Privacy Risks: Sharing personal information intentionally on social media, forums, or other platforms may expose Alex to privacy risks. Alex's active participation in online activities, such as searches, clicks, and interactions, contributes to targeted advertising. Advertisers may use this data to tailor ads based on his preferences. Companies may aggregate and analyze Alex's active digital footprint to create user profiles. Information shared actively, such as birthdays, locations, or workplace details, can be used in social engineering attacks.

Attackers may use this information to impersonate Alex or gain unauthorized access. Passive tracking through cookies, website analytics, and location data may result in a more invasive digital profile for Alex without his direct consent. The passive digital footprint, including IP addresses and device identifiers, can contribute to the loss of online anonymity, making it easier to trace Alex's online activities.

Passive data collected by various entities is stored in databases. If these databases are compromised in a data breach, sensitive information about Alex may be exposed. Passive digital footprints may contribute to broader surveillance efforts by governments or other entities, potentially infringing on privacy rights.

Ans. In conclusion, both active and passive digital footprints pose privacy and security challenges for Alex. Managing and mitigating these risks involve a combination of user awareness, informed decision-making, and the use of privacy-enhancing tools and practices. Alex should adopt a proactive approach to protect his online privacy and stay informed about evolving threats and best practices in digital security.

OR

The 3R's—Reduce, Reuse, and Recycle—are crucial principles for managing electronic waste (e-waste) responsibly. Here are three essential approaches along with practical examples of how individuals can actively participate in each:Purchase Wisely, Upgrade Instead of Replace,Donate or Sell, Repurposing etc

34. Write a program in python to create a DataFrame using any method like list, dictionary. 3

	A	B	C	D
Acct	99	94.0	92	97.0
Eco	90	94.0	92	97.0
Eng	95	89.0	91	89.0
IP	94	NaN	99	95.0
Math	97	100.0	99	NaN

Ans.
```
Dict={'A':[99,90,95,94,97],'B':[94,94,89,np.NaN,100],'C':[92,92,91,99,99],'D':[97,97,89,95
,np.NaN]}
df=pd.DataFrame(doct1,index=['Acct','Eco','Eng','IP','Math']
df
```

35. The height of 10 students of eighth grade are given below: 3

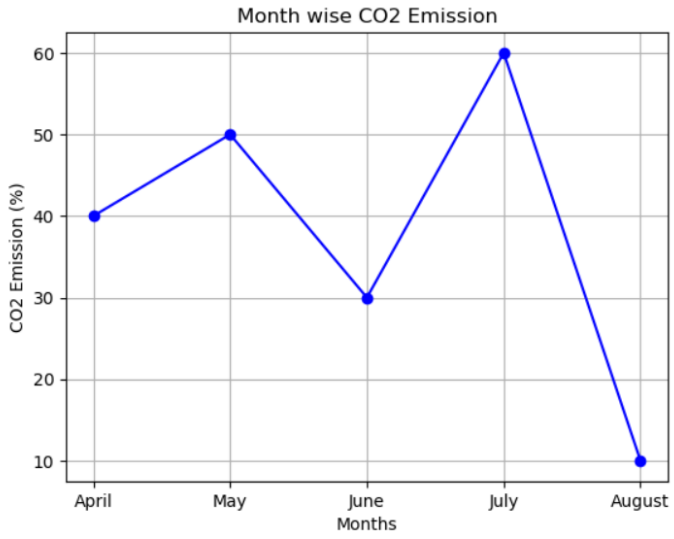
Height_cms=[145,141,142,142,143,144,141,141,143,144]

Write suitable Python code to generate a histogram based on the above data, along with an appropriate title and both axis labels.

Also give suitable python statement to save this chart.

OR

Write suitable Python code to create 'the following line chart "CO_2 Emission" having title and label for X and Y axis as shown below:



Ans:
```
import matplotlib.pyplot as plt
# Heights data
height_cms = [145, 141, 142, 142, 143, 144, 141, 141, 143, 144]
# Plotting the histogram
plt.hist(height_cms, bins=10, edgecolor='black')  # Adjust the number of bins as needed
# Adding title and labels
plt.title('Height Distribution of 8th Grade Students')
plt.xlabel('Height (cm)')
plt.ylabel('Number of Students')
# Display the histogram
plt.show()
```

OR

```
import matplotlib.pyplot as plt
months = ['April', 'May', 'June', 'July', 'August']
co2_emission = [40, 50, 30, 60, 10]
plt.plot(months, co2_emission, marker='o', linestyle='-', color='b')
plt.xlabel('Months')
plt.ylabel('CO2 Emission (%)')
plt.title('Month wise CO2 Emission')
plt.grid(True)
plt.savefig("emission.png")
plt.show()
```

36. Viruses, Pharming and Phishing are all examples of potential internet security issues. Explain what is meant by each of these three terms.

Ans:
- **Viruses**: A virus is a type of malicious software (malware) that attaches itself to a legitimate program or file and spreads from one computer to another. Once activated, a virus can corrupt or delete data, slow down system performance, or even take over a computer system to perform harmful activities.
- **Pharming**: Pharming is a cyberattack where users are redirected from a legitimate website to a fraudulent one without their knowledge. It exploits vulnerabilities in the domain name system (DNS) to mislead users, often to steal personal information like usernames, passwords, or financial details.
- **Phishing**: Phishing is a social engineering attack in which cybercriminals send fake emails, messages, or websites that appear to be from a trusted source (like a bank or company) to trick individuals into revealing sensitive information, such as passwords or credit card details.

Section-D

37. A relation **Vehicles** is given below: 4

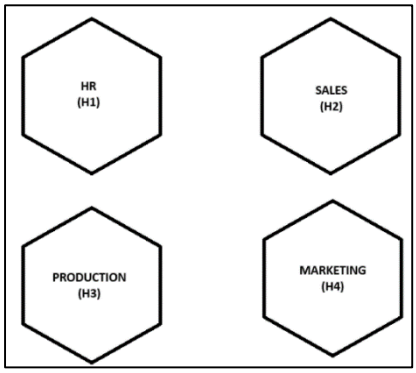
Vehicle_No	Type	Company	Price	Qty
MH12AB1234	Car	Toyota	800000.00	10
DL9C9876	Bike	Honda	90000.00	15
KA05MH6789	Truck	Tata	1500000.00	5
AP16JK1234	Bus	Ashok Leyland	2500000.00	2
GJ18QR5678	Car	Maruti Suzuki	650000.00	12
TN07ZL3456	Bike	Royal Enfield	150000.00	8

Write SQL queries :
(i) Display the average price of each type of vehicle having quantity more than 10.
(ii) Count the type of vehicles manufactured by each company.
(iii) Display the total price of all the types of vehicles.
(iv) Increase the price by 5%.

Ans: (i) SELECT Type, AVG(Price) AS Average_Price FROM Vehicles WHERE Qty > 10 GROUP BY Type;
(ii) SELECT Company, COUNT(DISTINCT Type) AS Type_Count FROM Vehicles GROUP BY Company;
(iii) SELECT SUM(Price * Qty) AS Total_Price FROM Vehicles;
(iv) UPDATE Vehicles SET Price = Price * 1.05;

38. "TCS tech, Bengaluru" is a company that deals with software development. They have different divisions HR (H1), Sales (H2), Production (H3) and Marketing (H4). The layout of the Bengaluru branch is : 4

Distance between the divisions are as follows:
H1 to H2 – 76 m
H1 to H3 – 185 m
H1 to H4 – 88m
H2 to H3 – 140 m
H2 to H4 – 125 m
P to D 150m
Numbers of computers in each division:
H1 – 140
H2 – 340
H3 – 180
H4 – 260



Based on the above specifications, answer the following questions:
(a) Suggest the topology and draw the most efficient cable layout for connecting all the divisions of Bengaluru branch.
(b) TCS tech, Bengaluru is expanding its reach and therefore it establishes a new office in Delhi. Out of LAN, WAN and MAN, what type of network will be formed to connect Bengaluru office with Delhi office.
(c) Suggest the division for the placement of server in Bengaluru branch. Explain the reason for your selection.
(d) Suggest the placement of the following devices in Bengaluru branch :
(i) Repeater
(ii) Hub/Switch
(e) The company's manager Ms. Ritu is worried as how she can extend and modify the functionality of the web browser. Help her by giving names of any two tools.

Ans: (a) Star (b) WAN (c) H2 Sales (d) Repeater : H1 to H3, H2 to H3, H2 to H4 – distance exceeds 100 m, Hub/ Switch in each division € Browser Extensions/Add-ons, Plug-in Example: Ad blocker, Adobe Acrobat

******* BEST OF LUCK *******