Marking Scheme

Strictly Confidential (For Internal and Restricted use only)

Senior Secondary School Certificate Examination, 2024

SUBJECT NAME INFORMATICS PRACTICES (SUBJECT CODE 065) (PAPER CODE 90)

1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2	"Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. Its' leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in News Paper/Website etc. may invite action under various rules of the Board and IPC."
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In class-XII, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.
4	The Marking scheme carries only suggested value points for the answers These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
6	Evaluators will mark(√) wherever answer is correct. For wrong answer CROSS 'X' be marked. Evaluators will not put right (✓) while evaluating which gives an impression that answer is correct and no marks are awarded. This is most common mistake which evaluators are committing.
7	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
8	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
9	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note "Extra Question".
10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
11	A full scale of marks 70 (marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.

12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).This is in view of the reduced syllabus and number of questions in question paper.
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past:- ● Leaving answer or part thereof unassessed in an answer book. ● Giving more marks for an answer than assigned to it. ● Wrong totaling of marks awarded on an answer. ● Wrong transfer of marks from the inside pages of the answer book to the title page. ● Wrong question wise totaling on the title page. ● Wrong totaling of marks of the two columns on the title page. ● Wrong grand total. ● Marks in words and figures not tallying/not same. ● Wrong transfer of marks from the answer book to online award list. ● Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) ● Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
14	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0) Marks.
15	Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
16	The Examiners should acquaint themselves with the guidelines given in the “Guidelines for Spot Evaluation” before starting the actual evaluation.
17	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
18	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.

SPECIFIC INSTRUCTIONS FOR INFORMATICS PRACTICES ONLY

1	**In Python, string content is accepted within a pair of single quotes ' ' or within a pair of double quotes " ".**
2	**In MySQL, CHAR/VARCHAR/DATE type content is accepted within a pair of single quotes ' ' or within a pair of double quotes " ".**
3	**In MySQL commands, lowercase/UPPERCASE both are correct.**
4	**In MySQL output questions, column headings to be ignored.**
5	**In MySQL output questions, alignment (left/right) of content to be ignored.**
6	**All answers/codes are suggestive, any other alternative correct answers to be accepted.**

SECTION-A

1.	In _____ topology, the devices are arranged in the form of multiple branches in hierarchical manner.				1
	(i)	Star	(ii)	Tree	
	(iii)	Mesh	(iv)	Bus	
Ans	(ii)	Tree			
	(1 Mark for the correct answer)				
2.	Ridhima purchased a license for a copy of a software and made additional copies without the permission of the copyright owner. This act of hers is known as _____.				1
	(i)	Trademark Infringement	(ii)	Identity Theft	
	(iii)	Copyright Infringement	(iv)	Patent	
Ans	(iii)	Copyright Infringement			
	(1 Mark for the correct answer)				
3.	What can an individual do to enhance the privacy of data stored digitally ?				1
	(i)	Share sensitive information on social media platforms.			
	(ii)	Use your date of birth as your password.			
	(iii)	Regularly update software installed on your device.			
	(iv)	Download and install software from unknown sources.			
Ans	(iii)	Regularly update software installed on your device			
	(1 Mark for the correct answer)				
4.	What will be the output of the following query ? `SELECT POWER(2,MOD(17,3));`				1
	(i)	`8`	(ii)	`1`	
	(iii)	`0`	(iv)	`4`	
Ans	(iv)	`4`			
	(1 Mark for the correct answer)				
5.	Which of the following is not an aggregate function in MYSQL ?				1
	(i)	`AVG()`	(ii)	`MAX()`	
	(iii)	`LCASE()`	(iv)	`MIN()`	
Ans	(iii)	`LCASE()`			
	(1 Mark for the correct answer)				
6.	_____is the gaining of unauthorized access to data in a computer system.				1
	(i)	Phishing	(ii)	Plagiarism	
	(iii)	Hacking	(iv)	Copyright violation	

Ans	(iii)	Hacking			
	(1 Mark for the correct answer)				
7.	Which of the following is NOT true with respect to CSV files ?				1
	(i)	Values are separated by commas.			
	(ii)	`to_csv()` can be used to save a dataframe to a CSV file.			
	(iii)	CSV file is created using a word processor.			
	(iv)	CSV file is a type of text file.			
Ans		All the options are true with respect to CSV files.			
	(Full 1 mark to be awarded for attempt / any one or more options is/are mentioned)				
8.	Which MySQL command helps to add a primary key constraint to any table that has already been created ?				1
	(i)	`UPDATE`	(ii)	`INSERT INTO`	
	(iii)	`ALTER TABLE`	(iv)	`ORDER BY`	
Ans	(iii)	`ALTER TABLE`			
	Note: Full 1 mark to be awarded for attempt / any one or more options is/are mentioned				
9.	What will be the output of the following query ? `SELECT SUBSTR("G20 2023 INDIA", 5, 4);`				1
	(i)	`G20 2`	(ii)	`2023`	
	(iii)	`INDI`	(iv)	`023`	
Ans	(ii)	`2023`			
	(1 Mark for the correct answer)				

10.	What will be the output of the following Python code ?
	`import pandas as pd`
	`dd= { 'One':1, 'Two':2, 'Three':3, 'Seven':7}`
	`rr=pd.Series(dd)`
	`rr['Four']=4`
	`print(rr)`
					1

	(i)	`One 1`
		`Two 2`
		`Three 3`
		`Seven 7`
		`dtype: int64`			

	(ii)	`One 1`
		`Two 2`
		`Three 3`
		`Four 4`
		`Seven 7`
		`dtype: int64`			

	(iii)	**Four 4 One 1 Two 2 Three 3 Seven 7 dtype: int64**			
	(iv)	**One 1 Two 2 Three 3 Seven 7 Four 4 dtype: int64**			
Ans	(iv)	**One 1 Two 2 Three 3 Seven 7 Four 4 dtype: int64**			
	Note: Full 1 mark to be awarded for attempt / any one or more options is/are mentioned				
11.	Which of the following clause cannot work with **SELECT** statement in MYSQL ?				1
	(i)	**FROM**	(ii)	**INSERT INTO**	
	(iii)	**WHERE**	(iv)	**GROUP BY**	
Ans	(ii)	**INSERT INTO**			
	(1 Mark for the correct answer)				
12.	Which of the following command will not show first five rows from the Pandas series named **S1** ?				1
	(i)	**S1[0:5]**	(ii)	**S1.head()**	
	(iii)	**S1.head(5)**	(iv)	**S1.head[0:5]**	
Ans	(iv)	**S1.head[0:5]**			
	(1 Mark for the correct answer)				
13.	Rama was unable to understand how the recruiters were able to know about her digital activity when she has not shared anything with them. The recruiters might have checked _____of Rama.				1
	(i)	Carbon Footprint	(ii)	Water Footprint	
	(iii)	Online print	(iv)	Digital Footprint	
Ans	(iv)	Digital Footprint			
	(1 Mark for the correct answer)				
14.	Which MySQL string function is used to extract a substring from a given string based on a specified starting position and length ?				1
	(i)	**SUBSTRING_INDEX()**	(ii)	**LENGTH()**	
	(iii)	**MID()**	(iv)	**TRIM()**	

Ans	(iii)	`MID()`			
	(1 Mark for the correct answer)				
15.	The software that is free for anyone, and its source code is available for access, modification, correction, and improvement is called _____.				1
	(i)	Proprietary software	(ii)	Commercial software	
	(iii)	Free and Open source software	(iv)	Copyrighted software	
Ans	(iii)	Free and Open source software			
	(1 Mark for the correct answer)				
16.	_____help in data protection through copyrights, patents and trademarks.				1
	(i)	Data Privacy Right	(ii)	Right to Innovation	
	(iii)	Intellectual Property Rights (IPR)	(iv)	Right to Data Protection	
Ans	(iii)	Intellectual Property Rights (IPR)			
	(1 Mark for the correct answer)				
17.	**Assertion (A) :** Cyber Bullying can have serious, emotional and psychological effects on victims. **Reason (R) :** Online Bullying is not a crime while offline bullying is a crime.				1
	(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 and (R) is false.			
	(iv)	(A) is false but (R) is true.			
Ans	(iii)	(A) Is true and (R) is false			
	(1 Mark for the correct answer)				
18.	**Assertion (A) :** A Series is a one dimensional array and a DataFrame is a two-dimensional array containing sequence of values of any data type. (int, float, list, string, etc.) **Reason (R) :** Both Series and DataFrames have by default numeric indexes starting from zero.				1
	(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 and (R) is false.			
	(iv)	(A) is false but (R) is true.			
Ans	(ii)	Both (A) and (R) are true and (R) is not the correct explanation for (A).			
	(1 Mark for the correct answer) ***Note: Option (i) also to be accepted.***				

SECTION-B

19.	**(a)**	Expand URL. Identify the protocol and domain in the following URL : **`https://epathshala.nic.in/topics.php?len=en`**	2
Ans	(a)	URL : **Uniform Resource Locator** Protocol - **`https`** Domain - **`epathshala.nic.in`**	
	(1 Mark for writing the correct expansion of URL) ***(½ Mark for writing the correct Protocol)*** ***(½ Mark for writing the correct Domain)***		
	(b)	**OR** Write any one advantage and one disadvantage of Star topology.	
Ans	(b)	**Advantage of Star Topology:** Centralized control and management makes it easy to monitor, troubleshoot, and scale the network. ***Other points to be accepted:*** ● reliable – if one cable or device fails then all the others still work ● high-performing as no data collisions can occur ● Easier to install ● Easy fault detection ● No disruption to the network when connecting or removing devices **Or Any other valid point.** **Disadvantage of Star Topology :** Dependence on the central device (hub or switch). If the central device fails, the entire network becomes inaccessible. ***Other points to be accepted:*** ● More Cable required ● More expensive **Or Any other valid point**	
	(1 Mark for writing any one correct* Advantage of Star Topology*) ***(1 Mark for writing any one correct Disa*dvantage of Star Topology*)***		
20.	The Python code written below has syntactical errors. Rewrite the correct code and underline the correction(s) made. **`import Pandas as pd`** **`stud=['Name':'Ramya','Class':11,'House':'Red']`** **`s=p.Series(s)`** **`print(s)`**		2
Ans	**`import pandas as pd`** **`stud = {'Name':'Ramya', 'Class':11, 'House':'Red'}`** **`s = pd.Series(stud)`** **`print(s)`**		
	(½ Mark for correcting each syntactical error) ***Note: Only 1 mark to be awarded if all the errors are correctly identified but correct code not written.***		

21. What will be the output of the following SQL queries : 2

(i)
```
SELECT RIGHT ("CHANDRAYAN3",4);
```

(ii)
```
SELECT ROUND(76345.456,2);
```

Ans (i)
```
YAN3
```

(ii)
```
76345.46
```

(1 Mark each for writing each correct output)

22. Find the output of the following Python code : 2

```
import pandas as pd
com=pd.Series([45,12,15,200],index=['mouse','printer',
'webcam','keyboard'])
print(com[1:3])
```

Ans
```
printer    12
webcam     15
dtype: int64
```

(1 Mark for each row of correct output)
Note:
- *Ignore* `dtype: int64`
- `Ignore order of columns in the output`
- `Only 1 mark to be awarded if an extra row is mentioned in the output`

23. What is the primary function of a gateway in a computer network ? Explain briefly. 2

Ans Gateway is used to connect two networks or applications that use different protocols.

(1 Mark for writing: connect two networks***)***
(1 mark for writing: use different protocols***)***
Note: Full 2 marks to be awarded if the function of gateway is explained with the help of only a diagram.

24. Consider the following Python code : 2

```
import pandas as pd
S1=pd.Series(['Rubina','Jaya','Vaibhav'],index=[10,16,18])
S2=pd.Series(_______, index=[10,16,18])
S3=pd.Series([56,67,86], _______ )
xiia={'Name':_______,'Subject':S2,'Marks':S3}
df=pd.DataFrame(_______)
print(df)
```

Complete the above Python code to display the following output :

```
      Name      Subject     Marks
10    Rubina    IP          56
16    Jaya      HSc         67
18    Vaibhav   IP          86
```

Ans
```
import pandas as pd
S1=pd.Series(['Rubina','Jaya','Vaibhav'], index=[10,16,18])
S2=pd.Series(['IP','HSc','IP'], index=[10,16,18])
S3=pd.Series([56,67,86], index=[10,16,18])
xiia={'Name':S1, 'Subject':S2, 'Marks':S3}
df=pd.DataFrame(xiia)
print(df)
```

(½ Mark each for writing each correct missing part of the given code)

25. Write any two differences between UPDATE and ALTER TABLE commands of MySQL. **2**

Ans

UPDATE	**ALTER TABLE**

• UPDATE command is used to modify value(s) stored in row(s) in a relation.
• It is a DML (Data Manipulation Language) command / UPDATE command performs action on data in a table.
• Example
`UPDATE Student`
`SET Marks=30`
`WHERE RollNo = 1;`
	• ALTER TABLE command is used to add, delete, modify, rename attribute(s) in a relation
	• It is a DDL(Data Definition Language) command / ALTER TABLE command performs action on the structure of the table.
	• Example
	`ALTER TABLE Student`
	`ADD Email varchar(255);`

Note: Full 2 marks to be awarded for attempting OR if Any part of question no 21 is attempted correctly.

SECTION-C

26. (a) Consider the given table and write the following queries in MySQL : **3**

Table: Sports

Sid	SName	Fees	DateofPlay	CoachId
1	Karate	1200	2024-08-24	S1
2	Football	1800	2024-09-13	S2
3	Cricket	1500	2024-06-14	S3
4	Lawn Tennis	2500	2024-09-25	S4
5	Badminton	1800	2024-10-20	S5

(i) To display Sid and name of those sports which are to be played in the month of September.

Ans
```
SELECT Sid, SName FROM Sports WHERE Monthname(DateofPlay)=
"September";
```
OR
```
SELECT Sid, SName FROM Sports WHERE Month(DateofPlay)= 9;
```

		OR **SELECT Sid, SName FROM Sports WHERE Month(DateofPlay)= '9';** **OR** **SELECT Sid, SName FROM Sports WHERE DateofPlay LIKE "%-09-%";** **OR** **SELECT Sid, SName FROM Sports WHERE DateofPlay>='2024-09-01' AND DateofPlay<='2024-09-30';** **OR** **SELECT Sid, SName FROM Sports WHERE DateofPlay BETWEEN '2024-09-01' AND '2024-09-30';**	
	(½ Mark for writing the correct SELECT part) ***(½ Mark for writing the correct WHERE part)***		
	(ii)	To display all Sports names in lower case.	
Ans		**SELECT LCASE(SName) FROM Sports;** **OR** **SELECT LOWER(SName) FROM Sports;**	
	(½ Mark for writing* `SELECT part`*) ***(½ Mark for writing* `FROM Sports`*)***		
	(iii)	To display last two characters of all sports names whose fees is less than 1500.	
Ans		**SELECT RIGHT(SName, 2) FROM Sports WHERE Fees<1500;** **OR** **SELECT MID(SName,LENGTH(SName)-1,2) FROM Sports WHERE Fees<1500;** **OR** **SELECT SUBSTR(SName,-2) FROM Sports WHERE Fees<1500;** **OR** **SELECT SUBSTR(SName,LENGTH(SName)-1,2) FROM Sports WHERE Fees<1500;** **OR** **SELECT SUBSTRING(SName,LENGTH(SName)-1,2) FROM Sports WHERE Fees<1500;**	
	(½ Mark for writing correct SELECT part) ***(½ Mark for writing correct WHERE part)***		
	(b)	**OR** Predict the output of the following queries based on the **table Sports** given above :	
	(i)	**SELECT UCASE(TRIM(SName)) FROM Sports WHERE Sid=5 ;**	
Ans	(i)	**BADMINTON**	
	(1 Mark for writing the correct output) ***Note: ½ mark to be awarded if the output is not in uppercase***		
	(ii)	**SELECT LEFT (SName,3) FROM Sports WHERE DateofPlay>"2024-09-13";**	

Ans	(ii)	**Law** **Bad**	
	(½ Mark each for writing correct line of the output)		
	(iii)	**SELECT SUBSTR (CoachId,1) FROM Sports WHERE SName="Cricket" or Fees>=2000;**	
Ans		**S3** **S4**	
	(½ Mark each for writing correct line of the output)		
27.	Kabir, a data analyst, has stored the voter's name and age in a dictionary. Now, Kabir wants to create a list of dictionaries to store data of multiple voters. He also wants to create a DataFrame from the same list of dictionaries having appropriate row labels as shown below : **Voter Name Voter_Age** **Ar1001 Arjun 35** **Ba3002 Bala 23** **Go4002 Govind 25** **Dh4007 Dhruv 19** **Na6005 Navya 18** Help Kabir in writing a Python program to complete the task.	3
Ans	**import pandas as pd** **voters=[{"Voter_Name":"Arjun", "Voter_Age":35}, {"Voter_Name":"Bala", "Voter_Age":23}, {"Voter_Name":"Govind", "Voter_Age":25}, {"Voter_Name":"Dhruv", "Voter_Age":19}, {"Voter_Name":"Navya", "Voter_Age":18}]** **dfVoters=pd.DataFrame(voters, index=["Ar1001","Ba3002","Go4002","Dh4007","Na6005"])** **print(dfVoters)** **OR** **Any other correct equivalent code**	
	(½ Mark for import statement) *(1 Mark for creating the list of dictionaries to store data of multiple voters)* *(½ Mark for creating DataFrame)* *(½ Mark for creating index)* *(½ Mark for displaying DataFrame)*	
28.	Answer the following questions based on the table Salesman given below :	3

Table: Salesman

salesman_id	name	city	commission
5001	Neil Bhatt	Delhi	0.15
5002	Rohan Malik	Mumbai	0.13
5005	Ravi Mohan	Delhi	0.11
5006	Mehak Rai	Delhi	0.14

	5007	Paul Lal	Bangalore	0.13
	5003	Raman Sen	Kolkata	0.12

	(i)	How many tuples does the given table have ?	
Ans	(i)	6	
	(1 Mark for writing the correct value)		
	(ii)	Suggest the primary key for the given table.	
Ans	(ii)	**salesman_id**	
	(1 Mark for writing the correct primary key) *Note: No mark to be awarded if any other column name is also mentioned along with the primary key.*		
	(iii)	Write the MySQL query to display all the records in descending order of commission.	
Ans	(iii)	**SELECT * FROM Salesman order by commission desc;**	
	(½ Mark for writing the correct SELECT part) *(½ Mark for writing the correct ORDER BY clause)*		
29.	(a)	Police officials arrested four members of an interstate gang for allegedly duping many people from different states on the pretext of providing them with holiday packages after creating fake websites of Tours and Travels. The cyber criminals sent fraudulent emails containing links to fraudulent websites created by them. The victim in his complaint told police that he was offered a holiday package to Dubai for a total of 10 times in the next 10 years and was charged ₹ 1.45 lakh through his credit card. Answer the following questions pertaining to the given news byte :	3
	(i)	Identify the type of cybercrime mentioned in above case.	
Ans	(i)	• Phishing • Internet Fraud	
	(1 Mark for writing any one correct type of cybercrime)		
	(ii)	Which Act deals with such crimes in India ?	
Ans	(ii)	IT Act 2000 **OR** Information Technology Act 2000	
	(1 Mark for writing the correct Act Name) *Note: The correct act without year 2000 also to be accepted*		
	(iii)	Suggest any one precaution that can be taken to avoid falling prey to such criminals.	
Ans	(iii)	• Ensure the website used is a trustworthy • Provide your personal/sensitive information only to reliable sources • Keep your browser up to date	

		• Use firewalls • Use Antivirus Software • Avoid installing pirated software • Always download software from known and secure websites • Always update software • Use strong password(s) and change it periodically • Do not use cookies from unknown sites • Perform online transactions from known and secure sites • Always secure wireless network(s) with strong password(s) and regularly change it/them	
	(1 Mark for suggesting any one correct precaution)		
	(b)	**OR** ABC Electronics, a popular electronics retail chain, has been a prominent player in the market for years. However, recent concerns over environmental degradation and e-waste have prompted the company to rethink its strategies and practices. As the newly appointed sustainability manager, you've been asked to answer the following questions :	
	(i)	Considering the environmental concerns associated with e-waste, outline any one negative impact of the electronic products on the environment.	
Ans	(i)	• Release toxic pollutants • Health hazards • Degradation of environment • Soil pollution • Water pollution • Air pollution OR Any other correct negative impact	
	(1 Mark for writing any one correct negative impact)		
	(ii)	Gopal is a college student who recently bought his new smartphone from ABC electronics. He's excited about the new features and improved performance of his new device. However, he's now left with his old smart phone, which is still functional but considered outdated. Suggest him any one action that he can take for his old smartphone.	
Ans	(ii)	Donate the old phone OR Sell the old phone OR Reuse the old phone OR Refurbish the old phone OR (Any other correct action)	
	(1 Mark for writing any one correct action)		
	(iii)	Provide any one recommendation on how ABC Electronics can responsibly manage its e-waste while minimizing harm to the environment.	

Ans	(iii)	Reduce the e-waste by extending the lifespan of devices through proper maintenance. OR Reuse the devices whenever possible. OR Recycle the e-waste components. OR Any other correct recommendation	
		(1 Mark for writing any one correct recommendation to manage e-waste)	
30.		Consider the given DataFrame 'password': **CodeName Category Frequency** **0 aaaaaa alpha 6.91** **1 dragon animal 18.52** **2 baseball sport 1.29** **3 football sport 11.11** **4 monkey animal 3.72** **5 qwerty alpha 1.85** **6 abcde alpha 3.19** Write suitable Python statements for the following :	3
	(i)	To add a new row with following values : **CodeName - 'abc123'** **Category - alphanumeric** **Frequency - 12.8**	
Ans	(i)	**password.loc[7]=['abc123','alphanumeric',12.8]** **OR** **password.at[7]=['abc123','alphanumeric',12.8]** **OR** **password.loc[len(password)] = ['abc123','alphanumeric',12.8]** **OR** **password.at[len(password)] = ['abc123','alphanumeric',12.8]** **OR** **password.loc[len(password.index)] = ['abc123','alphanumeric',12.8]** **OR** **password.at[len(password.index)] = ['abc123','alphanumeric',12.8]** **OR** **password.loc[7,:]=['abc123','alphanumeric',12.8]** **OR** **password.at[7,:]=['abc123','alphanumeric',12.8]** **OR** **password=password.append({"CodeName":"abc123","Category":"alphanumeric","Frequency":12.8}, ignore_index=True)**	

		OR
		`df1=pd.DataFrame({"CodeName":["abc123"],"Category":["alphanumeric"],"Frequency":[12.8]})`
		OR
		`password=pd.concat([password,df1], ignore_index=True)`	

	(1 Mark for writing any correct Python statement)		
	(ii)	To delete the row with the row label 2.	

Ans	(ii)	`password.drop(2, inplace=True)`
		OR
		`password.drop(2, inplace=True, axis=0)`
		OR
		`password.drop(labels=2, inplace=True)`
		OR
		`password.drop(labels=2, axis=0, inplace=True)`
		OR
		`password.drop([2], inplace=True)`
		OR
		`password.drop([2], axis=0, inplace=True)`
		OR
		`password=password.drop([2])`
		OR
		`password=password.drop([2], axis=0)`
		OR
		`password.drop([password.index[2]], inplace=True)`
		OR
		`password.drop(password.index[2:3], inplace=True)`	

	(1 Mark for writing any correct Python statement)		
	(iii)	To delete the column having column label as Frequency.	

Ans	(iii)	`password.drop("Frequency", axis=1, inplace=True)`
		OR
		`password.drop(columns=['Frequency'], inplace=True)`
		OR
		`password.drop(password.columns[2], axis=1, inplace=True)`
		OR
		`password.drop(password.iloc[:, 2:], inplace=True, axis=1)`
		OR
		`password.drop(password.loc[:, "Frequency":].columns, inplace=True, axis=1)`	

	(1 Mark for writing any correct Python statement)		

SECTION-D

31.	Rupam created a MySQL table to store the details of Nobel prize winners. Help her to write the following MySQL queries :	4

Table: NOBEL

Winner_id	YEAR	SUBJECT	WINNER	COUNTRY	CATEGORY
1001	1970	Physics	Hannes Alfven	Sweden	Scientist
1002	1970	Physiology	Bernard Katz	NULL	Scientist
1003	1970	Literature	Aleksandr Solzhenitsyn	Russia	Linguist
1004	1971	Chemistry	Gerhard Herzberg	Germany	Scientist
1005	1978	Peace	Menachem Begin	Israel	Prime Minister
1006	1987	Economics	Robert Solow	USA	Economist
1007	1994	Literature	Kenzaburo Oe	Japan	Linguist

(i) Display the names of Nobel Prize winner in 'Literature' for the year 1970.

Ans (i)
```
SELECT WINNER FROM NOBEL WHERE SUBJECT="Literature" AND YEAR = 1970;
```

(½ Mark for writing the correct SELECT part)
(½ Mark for writing the correct WHERE part)

(ii) Display the subject and category of winners whose country is not known.

Ans (ii)
```
SELECT SUBJECT,CATEGORY FROM NOBEL WHERE COUNTRY IS NULL;
```

(½ Mark for writing the correct SELECT part)
(½ Mark for writing the correct WHERE part)

(iii) Display the details of all Nobel Prize winners who were Scientists.

Ans (iii)
```
SELECT * FROM NOBEL WHERE CATEGORY="Scientist";
```

(½ Mark for writing the correct SELECT part)
(½ Mark for writing the correct WHERE part)

(iv) Count total number of winners whose subject is Literature.

Ans (iv)
```
SELECT COUNT(*) FROM NOBEL WHERE SUBJECT="Literature";
```

(½ Mark for writing the correct SELECT part)
(½ Mark for writing the correct WHERE part)

32. Ms. Ritika conducted an online assessment and stored the details in a DataFrame **result** as given below : 4

	Name	Score	Attempts	Qualify
a	Atulya	12.5	1	yes
b	Disha	9.0	3	no
c	Kavita	16.5	2	yes
d	John	15.0	1	no

Answer the following questions :

(i) Predict the output of the following Python statement:
```
print(result.loc [:,'Attempts'] > 1)
```

Ans	(i)	a False b True c True d False Name: Attempts, dtype: bool	
	(1 Mark for writing the correct output) *Name: Attempts, dtype: bool to be ignored* *Note: Full 1 Mark to be awarded if rows b and c are mentioned*		
	(ii)	Write the Python statement to display the last three records.	

Ans	(ii)	`print(result.tail(3))`
		OR
		`print(result.iloc[1:])`
		OR
		`print(result.iloc[1:4])`
		OR
		`print(result.iloc[[1,2,3],:])`
		OR
		`print(result.loc[["b","c","d"]])`	

	(1 Mark for writing the correct Python Statement)		
	(iii)	Write Python statement to display records of 'a ' and 'd' row labels.	

Ans	(iii)	`print(result.loc[["a","d"]])`
		OR
		`print(result.iloc[[0,3],:])`	

	(2 Marks for writing the correct Python Statement)		
	(iii)	OR (Option for Part (iii) only) Write suitable Python statement to retrieve the data stored in the file, `'registration.csv'` into a DataFrame, `'regis'`.	
Ans	(iii)	`regis=pd.read_csv("registration.csv")`	
	(2 Marks for writing the correct Python Statement)		

SECTION-E

33. Excellent Consultancy Pvt. Ltd. maintains two tables for all its employees. 5

Table: Employee

Employee_id	First_name	Last_name	Salary	Joining_date	Department
E101	Monika	Das	100000	2019-01-20	Finance
E102	Mehek	Verma	600000	2019-01-15	IT
E103	Manan	Pant	890000	2019-02-05	Banking

E104	**Shivam**	**Agarwal**	**200000**	**2019-02-25**	**Insurance**	
E105	**Alisha**	**Singh**	**220000**	**2019-02-28**	**Finance**	
E106	**Poonam**	**Sharma**	**400000**	**2019-05-10**	**IT**	
E107	**Anshuman**	**Mishra**	**123000**	**2019-06-20**	**Banking**	

Table: Reward

Employee_id	Date_reward	Amount
E101	2019-05-11	1000
E102	2019-02-15	5000
E103	2019-04-22	2000
E106	2019-06-20	8000

Write suitable SQL queries to perform the following task :

(i) Change the Department of Shivam to IT in the table Employee.

Ans (i)
```
UPDATE Employee SET Department="IT" WHERE First_name="Shivam";
```

Note: Full 1 mark to be awarded for attempting OR if Any part of question no 33 is attempted correctly.

(ii) Remove the record of **Alisha** from the table **Employee**.

Ans (ii)
```
DELETE FROM Employee WHERE First_name="Alisha";
```

(½ Mark for writing the correct DELETE part)
(½ Mark for writing the correct WHERE part)

(iii) Add a new column **Experience** of integer type in the table **Employee**.

Ans (iii)
```
ALTER TABLE Employee ADD Experience int;
```
OR
```
ALTER TABLE Employee ADD COLUMN Experience int;
```

Note: Full 1 mark to be awarded for attempting OR if Any part of question no 33 is attempted correctly.

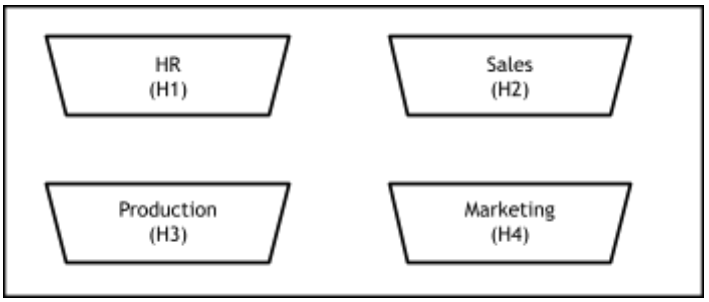
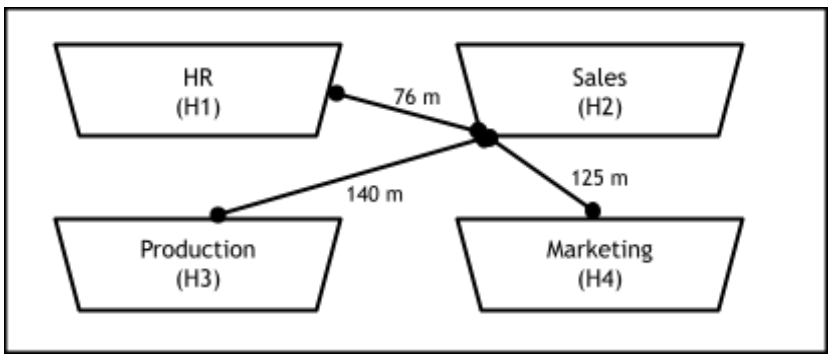
(iv) Display the first name, last name and amount of reward for all employees from the tables **Employee** and **Reward**.

Ans (iv)
```
SELECT First_name, Last_name, Amount FROM Employee NATURAL JOIN
Reward;
```
OR
```
SELECT First_name, Last_name, Amount FROM Employee E, Reward R
WHERE E.Employee_id=R.Employee_id;
```

(½ Mark for writing correct SELECT part)
(½ Mark for writing the correct part to join)

(v) Display first name and salary of all the employees whose amount is less than 2000 from the tables **Employee** and **Reward**.

Ans	(v)	**SELECT First_name, Salary FROM Employee NATURAL JOIN Reward WHERE Amount<2000;** **OR** **SELECT First_name, Salary FROM Employee E, Reward R WHERE E.Employee_id=R.Employee_id AND Amount<2000;**	
	(½ Mark for writing correct SELECT part) ***(½ Mark for writing the correct part to join)***		
	OR Write suitable SQL queries for the following task:		
	(i)	Display the year of joining of all the employees from the table **Employee.**	
Ans	(i)	**SELECT YEAR(Joining_date) FROM Employee;**	
	(½ Mark for writing correctly* SELECT YEAR(Joining_date) *) ***(½ Mark for writing correctly* FROM Employee*)***		
	(ii)	Display each department name and its corresponding average salary.	
Ans	(ii)	**SELECT Department, AVG(Salary) FROM Employee GROUP BY Department;**	
	(½ Mark for writing correct SELECT part) ***(½ Mark for writing the correct GROUP BY part)***		
	(iii)	Display the first name and date of reward of those employees who joined on Monday from the tables **Employee** and **Reward.**	
Ans	(iii)	**SELECT First_name, Date_reward FROM Employee NATURAL JOIN Reward WHERE DAYNAME(Joining_date)="Monday";** **OR** **SELECT First_name, Date_reward FROM Employee E, Reward R WHERE E.Employee_id=R.Employee_id AND DAYNAME(Joining_date)="Monday";**	
	(½ Mark for writing correct SELECT part) ***(½ Mark for writing correct WHERE part)***		
	(iv)	Display sum of salary of those employees whose reward amount is greater than 3000 from the tables **Employee** and **Reward.**	
Ans	(iv)	**SELECT SUM(Salary) FROM Employee NATURAL JOIN Reward WHERE Amount>3000;** **OR** **SELECT SUM(Salary) FROM Employee E, Reward R WHERE E.Employee_id=R.Employee_id AND Amount>3000;**	
	(½ Mark for writing correct SELECT part) ***(½ Mark for writing the correct WHERE part)***		
	(v)	Remove the table **Reward.**	
Ans	(v)	**DROP TABLE Reward;**	

	Note: Full 1 mark to be awarded for attempting OR if Any part of question no 33 is attempted correctly.		
34.	FULLMAN 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 :  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** — **76 m** **H1 to H3** — **185 m** **H1 to H4** — **88 m** **H2 to H3** — **140 m** **H2 to H4** — **125 m** **H3 to H4** — **160 m** Number of computers in each of the division : Division — Number of Computers H1 — 140 H2 — 340 H3 — 180 H4 — 260 Based on the above specifications, answer the following questions :	5
	(i)	Suggest the topology and draw the most efficient cable layout for connecting all the divisions of Bengaluru branch.	
Ans	(i)	Star Topology  	

	(½ Mark for writing correct topology) ***(½ Mark for drawing correct cable layout)***		
	(ii)	FULLMAN Tech is expanding its reach and therefore it establishes a new office in Delhi. Out of LAN, MAN, and WAN what kind of network will be created to connect Bengaluru office with Delhi Office ?	
Ans	(ii)	WAN	
	(1 Mark for writing the correct answer)		
	(iii)	Suggest the division for the placement of server in Bengaluru branch. Explain the reason for your selection.	
Ans	(iii)	Sales (H2). Maximum number of computers in Sales division	
	(½ Mark for writing correct division for server placement) ***(½ Mark for writing the correct reason for selection)***		
	(iv)	Suggest the placement of the following devices in Bengaluru branch: (a) Repeater (b) Switch/Hub	
Ans	(iv)	(a) Between Sales (H2) and Production (H3), Between Sales(H2) and Marketing(H4) (b) One in each of the divisions HR(H1), Sales(H2), Production(H3), Marketing(H4)	
	(½ Mark for writing correct placement of Repeater) ***(½ Mark for writing the correct placement of Switch/Hub)***		
	(v)	The company's manager Ms. Ritu is worried as to how she can extend and modify the functionality of the web browser. Help her by giving names of any two tools.	
Ans	(v)	Extensions Plug-ins Add-Ons	
	(½ Marks each for writing name of Any 2 correct tools / method) Note: ● Names of tools like Grammarly /AdBlock to be accepted. ● Mentioning of any 2 correct methods like Updation of browser/Change to faster browser/reinstalling browser to be accepted.		

35.	(a)	The inventory management software of a grocery shop stores the price of all fruits as follows:
		`Fruits=['Apple','Guava','Papaya','Grapes','Mango']`
		`Price=[150,70,50,30,120]`
		Write suitable Python code to generate a Bar Chart on the given data. Also add the chart title and label for X and Y axis. Also add suitable statement to save this chart with the name `fruits.png`.
			5

Ans	(a)	`import matplotlib.pyplot as plt` `#Statement 1`
		`Fruits=['Apple','Guava','Papaya','Grapes','Mango']` `#Statement 2`
		`Price=[150,70,50,30,120]` `#Statement 3`
		`plt.bar(Fruits,Price)` `#Statement 4`
		`plt.title("Fruits Prices")` `#Statement 5`
		`plt.xlabel("Fruits")` `#Statement 6`
		`plt.ylabel("Price")` `#Statement 7`
		`plt.savefig("fruits.png")` `#Statement 8`	

```
plt.show()                                                    #Statement 9
```

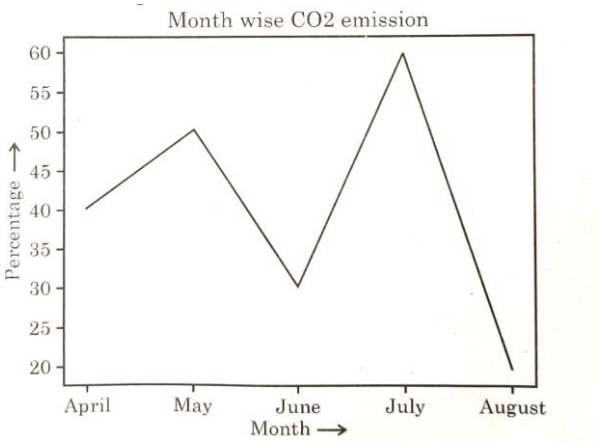
OR

Any other equivalent code

(½ Mark for writing correct `Statement 1`*)*
(½ Mark for writing correct `Statement 2`*)*
(½ Mark for writing correct `Statement 3`*)*
(1 Mark for writing correct `Statement 4`*)*
(½ Mark for writing correct `Statement 5`*)*
(½ Mark for writing correct `Statement 6`*)*
(½ Mark for writing correct `Statement 7`*)*
(½ Mark for writing correct `Statement 8`*)*
(½ Mark for writing correct `Statement 9`*)*

OR

(b) Write suitable Python code to draw the following line chart "CO2 Emission" having title and label for X and Y axis as shown below.



Also give suitable Python statement to save this chart with the name, **emission.png.**

Ans (b)

```
import matplotlib.pyplot as plt                          #Statement 1
month=["April", "May", "June", "July", "August"]         #Statement 2
percent=[40,50,30,60,20]                                 #Statement 3
plt.plot(month, percent)                                 #Statement 4
plt.title("Month wise CO2 emission")                     #Statement 5
plt.xlabel("Month")                                      #Statement 6
plt.ylabel("Percentage")                                 #Statement 7
plt.savefig("emission.png")                              #Statement 8
plt.show()                                               #Statement 9
```

OR

Any other equivalent code

(½ Mark for writing correct `Statement 1`*)*
(½ Mark for writing correct `Statement 2`*)*
(½ Mark for writing correct `Statement 3`*)*
(1 Mark for writing correct `Statement 4`*)*
(½ Mark for writing correct `Statement 5`*)*

	(½ Mark for writing correct `Statement 6`*)* *(½ Mark for writing correct* `Statement 7`*)* *(½ Mark for writing correct* `Statement 8`*)* *(½ Mark for writing correct* `Statement 9`*)*	