INFORMATICS PRACTICES (Code No. 065)
SAMPLE QUESTION PAPER (THEORY)
Class - XII (2026-27)

Time Allowed: 3 Hours **Maximum Marks: 70**

General Instructions:

- All questions are compulsory.
- The examination paper contains five sections, from Section A to Section E.
- Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
- Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
- Section C consists of 4 questions (29 to 32). Each question carries 3 Marks.
- Section D consists of 2 questions (33 to 34). Each question carries 4 Marks.
- Section E consists of 3 questions (35 to 37). Each question carries 5 Marks.
- There is no overall choice. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.
- All programming questions are to be answered using Python Language only.
- In case of MCQ, text of the correct answer should also be written.

QNO	Section-A (1 to 21) 21 x 1 = 21 Marks	MARKS
1	A Pandas Series S1 is created with index labels ['a', 'b', 'c', 'd', 'e']. State whether the following statement is True or False: "The statement S1['b':'d'] will produce the same result as S1[1:3]."	**1**
2	Ravi needs to find the total number of characters in the StudentName column. Which SQL function should he use? A. COUNT() B. SIZE() C. LENGTH() D. TOTAL()	**1**
3	Which type of Intellectual Property Right (IPR) protects an invention by giving the creator exclusive rights to make, use, and sell it for a specific period? A. Copyright B. Trademark C. Patent D. Software License	**1**
4	While plotting a graph using Matplotlib, which function is used to specify the label for the Y-axis? A. label_y() B. ylabel() C. yaxis_name() D. set_y()	**1**
5	I am a networking device that converts digital data from a computer into analog signals for transmission, and then converts incoming analog signals back into digital data for the computer to understand. Who am I?	**1**

*There is no change in the Question Paper Design and Assessment Pattern for Academic Session 2026-27.

	A. Repeater B. Router C. Modem D. Switch	
6	Which of the following is a Data Manipulation Language (DML) command in SQL? A. ALTER B. DROP C. UPDATE D. CREATE	**1**
7	The process of re-selling old electronic goods after minor repairs or modification is called: A. Recycling B. Refurbishing C. Reducing D. Leaching	**1**
8	What will be the output of the following code? import pandas as pd print(pd.Series(5, index=[0, 1, 2])) A. A Series with values 5, 5, 5 B. A Series with value 5 only at index 0 C. A Series with values 0, 1, 2 D. Error	**1**
9	Fill in the blank: The SQL clause used to filter the groups formed by the GROUP BY clause based on a specific condition is _____.	**1**
10	Riya visited an online shopping website, and it saved small text files on her computer to remember her preferences and session details. What are these files called? A. Plug-ins B. Add-ons C. Cookies D. Scripts	**1**
11	Which keyword is used with the ORDER BY clause to sort data in descending order? A. DESC B. DOWN C. DSC D. REVERSE	**1**
12	If we add two Pandas Series that do not have matching index labels, the result for those non-matching indices will be: A. 0 B. Error C. NaN D. Empty string	**1**
13	The process of buying electronic gadgets only when necessary to minimize the generation of electronic waste is an example of which 'R' of e-waste management? A. Recycle	**1**

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	B. Reuse C. Reduce D. Refurbish	
14	Which SQL function is used to extract a specific number of characters from a string starting from a given position? A. LEFT() B. RIGHT() C. LENGTH() D. MID()	**1**
15	Aman is exporting a Pandas DataFrame to a CSV file using the to_csv() function. He wants to save only the data and avoid writing the row indices to the file. Which parameter should he set to False to prevent the indices from being included? A. header B. sep C. index D. columns	**1**
16	Fill in the blank: The process of storing a website on a web server so that it can be accessed over the internet is known as _____.	**1**
17	A HR manager queries an employee database. He wants to retrieve only those records where the Commission field actually contains a value. Which SQL condition should he use? A. WHERE Commission != NULL B. WHERE Commission IS NOT NULL C. WHERE Commission <> NULL D. WHERE Commission NOT NULL	**1**
18	When creating a DataFrame from a list of dictionaries, the dictionary keys become: A. Row indices B. Data values C. Column labels D. Positional Index	**1**
19	State whether the following statement is True or False: In SQL, the BETWEEN operator is inclusive of both the lower and upper values specified in the range.	**1**
	Q. 20 and Q. 21 are Assertion (A) and Reason (R) type questions. Choose the correct option as: A. Both Assertion (A) and Reason (R) are True and Reason (R) is the correct explanation for Assertion (A). B. Both Assertion (A) and Reason (R) are True and Reason (R) is not the correct explanation for Assertion (A). C. Assertion (A) is True and Reason (R) is False. D. Assertion (A) is False, but Reason (R) is True.	
20	**Assertion (A)** The statement df.drop('Science', axis=0) will remove the column labeled 'Science' from the DataFrame. **Reason (R)** In Pandas drop() method, axis=0 refers to row-wise operations and axis=1 refers to column-wise operations.	**1**
21	**Assertion (A)** In SQL, the query select * from emp; and SELECT * FROM EMP; will produce the same result. **Reason (R)** SQL is a case-sensitive language.	**1**
	Section-B (22 to 28) 7X2 = 14 Marks	

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22	**(A)** (i) Explain the use of the head() function in a Pandas DataFrame. (ii) What happens if the parameter n is not specified in the head() function? **OR** **(B)** Explain the concept of Boolean Indexing in DataFrames. Write a small Python code example to demonstrate it.	**2**
23	Differentiate between an Active and a Passive digital footprint.	**2**
24	Define Data Visualization and state its primary purpose.	**2**
25	**(A)** Define Star Topology. Mention one major advantage of using it. **OR** **(B)** What is VoIP? State any one advantages of using VoIP for communication.	**2**
26	Write SQL queries for the following requirements: (i) Display the last 3 characters of the attribute Ename from the EMPLOYEE table. (ii) Find the position of the substring 'ma' in the string 'Informatics'.	**2**
27	Mention and briefly explain any two guidelines of netiquette.	**2**
28	**(A)** Consider the following two dictionaries: dict1 = {'a': 10, 'b': 20} dict2 = {'a': 5, 'b': 10, 'c': 20} Write Python code to create a DataFrame from a list containing the above two dictionaries. **OR** **(B)** Mention the purpose of read_csv() and explain the use of its sep parameter.	**2**
	Section-C (29 to 32) 4X3 = 12 Marks	
29	Consider the following digital security scenarios and answer the questions: (i) Mehak receives an SMS from an unknown number stating she has won a lottery. To claim it, she must click a link and enter her Aadhaar number and bank OTP. What type of cybercrime is this? (ii) A group of people repeatedly post insulting comments and spread rumors about a classmate on a social media platform to distress them. What is this activity called? (iii) Suggest one Communication Etiquette that should be followed to maintain credibility while participating in an online discussion forum.	**3**
30	**(A)** (i) Write a Python program to create a Pandas Series named Inventory from the following dictionary: stock = {'Pens': 150, 'Erasers': 80, 'Sharpeners': 60, 'Notebooks': 200}. (ii) Consider two Series S1 and S2: import pandas as pd S1 = pd.Series([10, 20], index=['a', 'b']) S2 = pd.Series([30, 40], index=['b', 'c']) Write the output of the statement: print(S1 + S2) **OR**	**3**
	(B) Consider a DataFrame df as shown below: Name IP Maths	

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	0 Arpit 95 88 1 Vani 89 92 2 Chetan 78 80 Write Pandas statements to perform the following actions: (i) Add a new column 'Total' containing the values [183, 181, 158]. (ii) Rename the 'Name' column to 'Student'. (iii) Delete the 'Maths' column from the DataFrame.	
31	Consider the table HOSPITAL, which contains the following columns: Column Name – Remark PNo – Patient Number PName – Patient Name Dept – Department DOA – Date of Admission Table: HOSPITAL PNo | PName | Dept | DOA 101 | Ravi Kumar | Cardiology | 2024-05-12 102 | Anita Sharma | Neurology | 2025-06-01 103 | Mohan Das | Cardiology | 2023-05-18 104 | Seema Verma | Orthopedics | 2022-04-22 105 | Rahul Singh | Cardiology | 2025-03-30 Write SQL queries to perform the following tasks: (i) Display the names of all patients in the Cardiology department in lowercase. (ii) Display each patient's number along with the day name of the week on which they were admitted. (iii) Display the patient names arranged in alphabetical order.	**3**
32	**(A)** Consider a table named STUDENT containing the following data: ID | Name | DOB 1 | Aman | 2005-08-15 2 | Vinod | 2006-01-26 3 | Saurabh | 2004-01-01 Write the output of the following SQL queries: (i) SELECT UPPER(Name), LENGTH(Name) FROM STUDENT WHERE ID = 2; (ii) SELECT DAY(DOB), YEAR(DOB) FROM STUDENT WHERE ID = 3; (iii) SELECT RIGHT(Name, 3) FROM STUDENT WHERE ID = 1; **OR** **(B)** Write the output of the following SQL queries: (i) SELECT POWER(MOD(13, 5), 2); (ii) SELECT UCASE(MID("Digital India", 9, 5)); (iii) SELECT LENGTH(TRIM(" Informatics "));	**3**
	Section-D (33 to 34) 2X4 = 8 Marks	**MARKS**
33	Write a Python program using Matplotlib to plot a Line Graph showing the "Monthly Sales" of a shop with the following data: Months: ['Jan', 'Feb', 'Mar', 'Apr'] Sales: [12000, 15000, 11000, 18000] The program should include: • Code to import the required library.	**4**

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- Code to plot the line graph with a label "Sales".
- A title "Sales Performance".
- Labels for both X-axis ("Month") and Y-axis ("Amount").
- Code to display the legend and show the plot.

34 **(A)** Consider the following tables: **4**

Table: SPORTS

RegNo	SName	Game	Fees
101	Aryan	Cricket	500
102	Riya	Tennis	600
103	Kabir	Cricket	500
104	Ishaan	Tennis	600
105	Tejas	Football	750

Table: COACH

CoachID	CName	Game
C1	Venkatesh	Cricket
C2	Rameshwar	Tennis
C3	Sridhar	Football

Write SQL queries for the following:
(i) Display the Game name and the total fees collected for each game, but only for those games where the total fees exceed 1000.
(ii) Display the Student Name (SName) and their respective Coach Name (CName).

OR

(B) Consider the following tables:

Table: Employee

EmpID	Name	DeptID	Salary
301	Aarav	D1	5200
302	Riya	D2	7500
303	Kabir	D2	6800
304	Ananya	D3	4000
305	Ishaan	D1	4900

Table: Department

DeptID	DeptName
D1	HR
D2	IT
D3	Sales

Write the output of the following SQL queries:

(i) SELECT DeptID, COUNT(*), MAX(Salary) FROM Employee GROUP BY DeptID HAVING COUNT(*) > 1 ORDER BY DeptID;
(ii) SELECT Name, DeptName FROM Employee, Department WHERE Employee.DeptID = Department.DeptID AND Employee.Salary > 6000;

Section-E (35 to 37) 3X5 = 15 Marks

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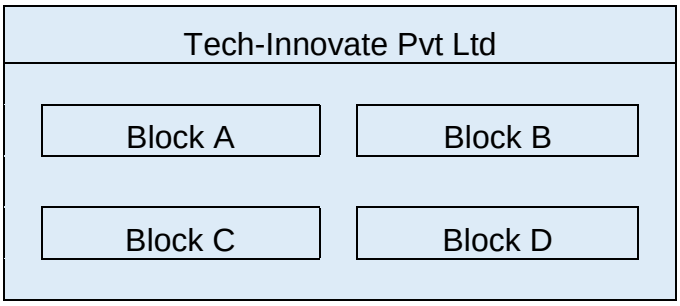
35	Tech-Innovate Pvt Ltd is a leading technology solutions provider renowned for delivering innovative digital services to clients worldwide. The company operates from a spacious campus comprising four blocks: Block A, Block B, Block C, and Block D.  To ensure smooth communication, centralized data storage, and high-speed connectivity across the campus, the organization plans to set up a structured network connecting all blocks. The following tables provide the distances between the blocks and the number of computers in each block. From / To / Distance (meters) Block A / Block B / 40 m Block A / Block C / 50 m Block A / Block D / 160 m Block B / Block C / 70 m Block B / Block D / 60 m Block C / Block D / 120 m Block / Number of Computers Block A / 25 Block B / 60 Block C / 15 Block D / 150 As a network engineer, answer the following questions based on the details given above: (i) Suggest the most suitable block to install the server. Justify your answer. (ii) What type of network (PAN, LAN, MAN, or WAN) will be formed within the campus? (iii) Suggest the placement of a Switch with suitable justification. (iv) The company wants to host a website where clients can log in and see real-time project updates. Should they develop a Static or a Dynamic website? Why? (v) Identify between which blocks a repeater is needed and justify your answer.	**5**
36	(i) Create a DataFrame named StoreDF as shown below using dictionary of series: Items / Quantity / Unit_Price 0 Bread 50 30 1 Milk 100 25 2 Eggs 120 6 Write suitable Pandas statements to Perform the following operations: (ii) Add a new row containing data [Butter, 40, 55]	**3+1+1 = 5**

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	(iii) Display values of Items column only,	
37	**(A)** Refer to the table given below: Table: BOOK BookID | Title | Author | Price 201 | Wings of Fire | A P J Abdul Kalam | 350 202 | The Guide | R. K. Narayan | 299 203 | The God of Small Things | Arundhati Roy | 399 204 | Malgudi Days | R. K. Narayan | 280 Write SQL commands for the following tasks: (i) Insert a new record into the table with the values: 205, The White Tiger, Aravind Adiga, 350. (ii) Update the Price of the book with BookID 202 to 325. (iii) Delete the records of all books written by 'R. K. Narayan'. (iv) Add a new column Publisher of type VARCHAR(30) to the table. (v) Drop the table BOOK from the database. **OR** **(B)** Consider a table named PRODUCT, which contains the following columns: PCode, PName, Category, Qty, Price, ExpiryDate. The columns are described as follows: PCode – A unique code assigned to each product. PName – The name of the product. Category – The category or type of the product. Qty – The available quantity of the product. Price – The unit price of the product. ExpiryDate – The expiration date of the product. Write SQL queries for: (i) Display PName and its Price rounded to one decimal place. (ii) Display the names of products that end with the letter 's'. (iii) Display the PName and Category of those products whose Price is less than or equal to 500. (iv) Display the total quantity of all products. (v) Display PName after removing leading spaces only.	**5**

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INFORMATICS PRACTICES (Code No. 065)
MARKING SCHEME
Class - XII (2026-27)

Time Allowed: 3 Hours **Maximum Marks: 70**

General Instructions:

- All questions are compulsory.
- The examination paper contains five sections, from Section A to Section E.
- Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
- Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
- Section C consists of 4 questions (29 to 32). Each question carries 3 Marks.
- Section D consists of 2 questions (33 to 34). Each question carries 4 Marks.
- Section E consists of 3 questions (35 to 37). Each question carries 5 Marks.
- There is no overall choice. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.
- All programming questions are to be answered using Python Language only.

QNO	Section-A (1 to 21) 21 x 1 = 21 Marks	MARKS
1	False *(1 mark for correct answer)*	**1**
2	C. LENGTH() *(1 mark for correct answer)*	**1**
3	C. Patent *(1 mark for correct answer)*	**1**
4	B. ylabel() *(1 mark for correct answer)*	**1**
5	C. Modem *(1 mark for correct answer)*	**1**
6	C. UPDATE *(1 mark for correct answer)*	**1**
7	B. Refurbishing *(1 mark for correct answer)*	**1**
8	A. A Series with values 5, 5, 5 *(1 mark for correct answer)*	**1**
9	HAVING *(1 mark for correct answer)*	**1**
10	C. Cookies *(1 mark for correct answer)*	**1**
11	A. DESC *(1 mark for correct answer)*	**1**
12	C. NaN *(1 mark for correct answer)*	**1**
13	C. Reduce *(1 mark for correct answer)*	**1**
14	D. MID() *(1 mark for correct answer)*	**1**
15	C. index *(1 mark for correct answer)*	**1**
16	Web hosting or Hosting *(1 mark for correct answer)*	**1**

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17	B. WHERE Commission IS NOT NULL *(1 mark for correct answer)*	**1**
18	C. Column labels *(1 mark for correct answer)*	**1**
19	True *(1 mark for correct answer)*	**1**
20	D. Assertion (A) is False, but Reason (R) is True. *(1 mark for correct answer)*	**1**
21	C. Assertion (A) is True and Reason (R) is False. *(1 mark for correct answer)*	**1**
	Section-B (22 to 28) 7X2 = 14 Marks	
22	**(A)** (i) The head() function displays the first n rows of a DataFrame. (ii) If n is not specified in head(), it returns the first 5 rows by default. *(1 mark for each correct part)* **OR** **(B)** Boolean indexing is a technique used to select subsets of data based on the actual values in the DataFrame rather than row/column labels. **Example** import pandas as pd data = [{'Name': 'Aarav', 'Age': 24}, {'Name': 'Priya', 'Age': 30}] df = pd.DataFrame(data) print(df['Age'] > 25) **Output** **0 False** **1 True** *(1 mark for each correct part)*	**2**
23	Active digital footprint: An active digital footprint is created when a person intentionally shares or submits information online. Passive digital footprint: A passive digital footprint is created when information is collected automatically, often without the user's knowledge or direct involvement. *(2 mark for correct differentiation)*	**2**
24	Data visualization is the graphical or pictorial representation of data using graphs, charts, etc. Its primary purpose is to visualize variations or show relationships between variables, helping users to infer conclusions that might not be easily visible by looking at raw numerical data. *(1 mark for each correct part)*	**2**
25	**(A)** In star topology, each node is directly connected to a central controller (hub or switch). Advantage: Failure of one node does not affect the rest of the network. *(1 mark for each correct part)* **OR**	**2**
	(B) VoIP stands for Voice over Internet Protocol, which allows voice transmission over a computer network rather than traditional telephone lines. Advantages:	

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		Very economical/free compared to traditional international calls. *(1 mark for each correct part)*	
26	(i) SELECT RIGHT(Ename, 3) FROM EMPLOYEE; (ii) SELECT INSTR('Informatics', 'ma'); *(1 mark for each correct part)*		**2**
27	**Be Ethical:** Do not violate copyright laws; always seek permission before using or sharing copyrighted material. **Be Respectful:** Respect the privacy, opinions, and cultural diversity of others, especially in public online forums. *(1 mark for each correct guidelines)*		**2**
28	**(A)** import pandas as pd dict1 = {'a': 10, 'b': 20} dict2 = {'a': 5, 'b': 10, 'c': 20} df = pd.DataFrame([dict1, dict2]) print(df) *(2 mark for correct program)* **OR** **(B)** read_csv() is used to load data from a CSV file into a Pandas DataFrame. sep: Specifies the delimiter (e.g., comma, semicolon). *(1 mark for each correct part)*		**2**
	Section-C (29 to 32) 4X3 = 12 Marks		
29	(i) Phishing (ii) Cyber Bullying (iii) Be Credible/Use polite language *(1 mark for each correct part)*		**3**
30	**(A)** (i) import pandas as pd stock = {'Pens': 150, 'Erasers': 80, 'Sharpeners': 60, 'Notebooks': 200} Inventory = pd.Series(stock) print(Inventory) (ii) Output: a NaN b 50.0 c NaN *(2 marks for correct program)* *(1 mark for correct output)* **OR** **(B)** (i) df['Total'] = [183, 181, 158] (ii) df.rename(columns={'Name': 'Student'}, inplace=True) (iii) df.drop(columns=['Maths'], inplace=True) *(1 mark for each correct part)*		**3**
31	(i) SELECT LOWER(PName) FROM HOSPITAL WHERE Dept = 'Cardiology'; (ii) SELECT PNo, DAYNAME(DOA) FROM HOSPITAL; (iii) SELECT PName FROM HOSPITAL ORDER BY PName ASC; *(1 mark for each correct part)*		**3**
32	**(A)** (i)		**3**

UPPER(Name)	LENGTH(Name)
VINOD	5

(ii)

DAY(DOB)	YEAR(DOB)
1	2004

*There is no change in the Question Paper Design and Assessment Pattern for Academic Session 2026-27.

	(iii) RIGHT(Name, 3) man *(1 mark for each correct part)* **OR**	
	(B) (i) 9 (ii) INDIA (iii) 11 *(1 mark for each correct part)*	
	Section-D (33 to 34) 2X4 = 8 Marks	
33	import matplotlib.pyplot as plt months = ['Jan', 'Feb', 'Mar', 'Apr'] sales = [12000, 15000, 11000, 18000] plt.plot(months, sales, label="Sales") plt.title("Sales Performance") plt.xlabel("Month") plt.ylabel("Amount") plt.legend() plt.show() (*1 mark for correct imports)* *(1 mark for correct use of plot with label)* *(1/2 mark for title)* *(1/2 mark for labels)* *(1/2 mark for legend)* *(1/2 mark for show)*	**4**
34	**(A)** (i) SELECT Game, SUM(Fees) FROM SPORTS GROUP BY Game HAVING SUM(Fees) > 1000; (ii) SELECT SName, CName FROM SPORTS, COACH WHERE SPORTS.Game = COACH.Game; *(2 mark for correct part(i), 2 mark for correct part(ii))* **OR** **(B)** (i) **DeptID** | **COUNT(*)** | **MAX(Salary)** D1 | 2 | 5200 D2 | 2 | 7500 (ii) **Name** | **DeptName** Riya | IT Kabir | IT *(2 mark for correct part(i), 2 mark for correct part(ii))*	**4**
	Section-E (35 to 37) 3X5 = 15 Marks	
35	(i) Block D. It is the most suitable because it has the maximum number of computers (150). (ii) LAN (Local Area Network). The distance is within a single campus/limited area. (iii) Switch: Every block (A, B, C, D) should have a switch to connect multiple computers within that block. (iv) Dynamic Website. Since it involves user logins and real-time data updates from a database, a dynamic site is required.	**5**

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	(v) Between Block A and Block D, & Block C and Block D, because Repeaters are needed as distance exceeds ~100m for Ethernet. *(1 mark for each correct part)*	

36	(i)
	import pandas as pd
	data = {
	'Items': pd.Series(['Bread', 'Milk', 'Eggs']),
	'Quantity': pd.Series([50, 100, 120]),
	'Unit_Price': pd.Series([30, 25, 6])
	}
	StoreDF = pd.DataFrame(data)
	print(StoreDF)
	(ii)
	StoreDF.loc[3] = ['Butter', 40, 55]
	(iii)
	print(StoreDF['Items'])
	(3 mark for correct part(i), 1 mark for correct part(ii), 1 mark for correct part(iii))
		5

37	**(A)** (i) INSERT INTO BOOK VALUES (205, 'The White Tiger', 'Aravind Adiga', 350); (ii) UPDATE BOOK SET Price = 325 WHERE BookID = 202; (iii) DELETE FROM BOOK WHERE Author = 'R. K. Narayan'; (iv) ALTER TABLE BOOK ADD Publisher VARCHAR(30); (v) DROP TABLE BOOK; *(1 mark for each correct part)* **OR** **(B)** (i) SELECT PName, ROUND(Price, 1) FROM PRODUCT; (ii) SELECT PName FROM PRODUCT WHERE RIGHT(PName,1) = 's'; (iii) SELECT PName, Category FROM PRODUCT WHERE Price <= 500; (iv) SELECT SUM(Qty) FROM PRODUCT; (v) SELECT LTRIM(PName) FROM PRODUCT; *(1 mark for each correct part)*	**5**

*There is no change in the Question Paper Design and Assessment Pattern for Academic Session 2026-27.

INFORMATICS PRACTICES – Code No. 065
SAMPLE QUESTION PAPER*
Class - XII - (2025-26)

Time Allowed: 3 Hrs. **Maximum Marks:70**

General Instructions:

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- The examination paper contains five sections, from Section A to Section E.
- Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
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- All programming questions are to be answered using Python Language only.
- In case of MCQ, text of the correct answer should also be written.

Q No.	Section-A (21 x 1 = 21 Marks)	Marks
1	**State whether the following statement is True or False:** The **drop()** method can be used to remove rows or columns from a Pandas DataFrame.	1
2	**What will be the result of the following SQL query?** **SELECT MOD(5, 6);** (A) 3 (B) 5 (C) 6 (D) 0	1
3	**Shruti received an email that appeared to be from a popular social media platform, requesting her to click a link to reset her password. The link directed her to a fraudulent website designed to capture her login credentials. This situation is an example of which type of cybercrime?** (A) Cyber Bullying (B) Violation of Intellectual Property Rights (C) Hacking (D) Phishing	1

*Please note that the assessment scheme of the Academic Session 2024-25 will continue in the current session i.e. 2025-26.

4	**Which of the following Python statements is used to write a Pandas DataFrame df to a CSV file?** (A) **df.to_csv()** (B) **df.write_csv()** (C) **df.to_table()** (D) **df.export_csv()**	1
5	**Which of the following device is used for converting digital signals from a computer into analog signals for transmission over a telephone line.** (A) Modem (B) Switch (C) Repeater (D) Router	1
6	**What is the purpose of the ROUND(num, 0) in SQL, assuming num is a number with a fractional part?** (A) Rounds the number to the nearest integer (B) Always rounds the number up (C) Leaves the number unchanged (D) Always rounds the number down	1
7	**Aarushi has written a novel and wants to protect her literary work. Which type of Intellectual Property right will help her do that?** (A) Patent (B) Copyright (C) Trademark (D) Both Copyright & Trademark	1
8	**The default index used in a Pandas Series, if no index is explicitly specified, is _____** (A) Strings starting with 'a' (B) Consecutive integers starting from 1 (C) Random integers (D) Consecutive integers starting from 0	1
9	**Consider a table named Students that has one primary key and three alternate keys. How many candidate keys does the table have?**	1

	(A) 1 (B) 2 (C) 3 (D) 4	
10	**Which of the following is an application of VoIP technology?** (A) Email (B) Chat (C) Internet Telephony (D) Web Browsing	1
11	**Which of the following SQL function is used to count the non-NULL values in a column named column_name?** (A) COUNT(*) (B) COUNT(column_name) (C) SUM(column_name) (D) AVG(column_name)	1
12	**When two Pandas Series with different indices are added, the result is _____.** (A) Error occurs (B) Indices are ignored, and elements are added in order (C) The result has all indices, with missing values filled as NaN (D) Only the common indices are retained in the result	1
13	**In India, the primary law that deals e-commerce and cybercrime is _____.** (A) Cybercrime Prevention Act, 2000 (B) Digital Security Act, 2000 (C) Information Technology Act, 2000 (D) E-Commerce Regulation Act, 2008	1
14	**Which SQL command is used to sort rows in either ascending or descending order of values in a specific column?** (A) ORDER BY (B) SORT BY (C) GROUP BY	1

	(D) SORT ON	
15	**Which of the following Python commands selects the first 3 rows of a DataFrame df, assuming that labelled index are consecutive integers starting from 0?** (A) df.loc[:3] (B) df.loc[:2] (C) df.loc[0:4] (D) df.loc[1:4]	1
16	**In which network topology is every node directly connected to every other node?** (A) Star (B) Tree (C) Mesh (D) Bus	1
17	**What is the use of the INSTR() function in SQL?** (A) To replace characters in a string (B) To find the length of a string (C) To find the position of a substring in a string (D) To extract characters from a string	1
18	**Which of the following Python statements creates an empty Pandas DataFrame (Note: pd is an alias for pandas)?** (A) pd.DataFrame(None) (B) pd.DataFrame() (C) pd.DataFrame([]) (D) pd.DataFrame.empty()	1
19	**Which of the following is NOT an aggregate function in SQL?** (A) MIN() (B) SUM() (C) UPPER() (D) AVG()	1

	Q-20 and Q-21 are Assertion (A) and Reason (R) Type questions. Choose the correct option as: (A) Both A and R are True, and R correctly explains A. (B) Both A and R are True, but R does not correctly explain A. (C) A is True, but R is False. (D) A is False, but R is True.		
20	**Assertion (A):**. The output of **print(df)** and **print(df.loc[:])** will be same for a DataFrame **df**. **Reason (R):** The statement **print(df.loc[:])** will display all rows and columns of the DataFrame df, thus showing the entire data.		1
21	**Assertion (A):** The **INSERT INTO** command is a **DML** (Data Manipulation Language) command. **Reason (R): DML** commands are used to insert, update or delete the data stored in a database.		1
Q No.	**Section-B (7X2 = 14 Marks)**		**Marks**
22	(A)	What is a DataFrame in Pandas? Mention any one property of DataFrame. **OR** (B) List any two differences between Series and DataFrame in Pandas.	2
23	What is e-waste? Mention any one impact of e-waste on the environment.		2
24	Ravi wants to create a Pandas Series as shown below: January 31 February 28 March 31 Help him in completing the code below to achieve the desired output. Note: **ser_data** is a dictionary. **import _____ as pd** **ser_data = _____** **s = pd._____(ser_data)** **print(s)**		2

25	(A)	Rohan, a Class XII student, has written code for a website but is unsure how to make it available on the Internet. Explain to Rohan the role of a web server and web hosting in ensuring availability of his website on the internet. **OR**	2
	(B)	Explain the concept of VoIP and mention one benefit of using it.	
26	Write SQL queries to perform the following: I. Display the name of the day (e.g., Monday, Tuesday) for the date **'2026-01-01'**. II. Find and display the position of the substring **"India"** in the string **"Incredible India"**		2
27	Define digital footprints. Differentiate between active and passive digital footprints.		2
28	(A)	Write the output of the following code: **import pandas as pd** **students = pd.Series(['Abhay', 'Ananya', 'Javed'])** **marks = pd.Series([85, 92, 88])** **data = {'Name': students, 'Marks': marks}** **df = pd.DataFrame(data)** **df.rename(columns={'Name': 'StuName', 'Marks': 'Score'}, inplace=True)** **print(df)**	2
	(B)	**OR** Write the output of the following code: **import pandas as pd** **states = pd.Series(['Maharashtra', 'Gujarat', 'Kerala'])** **capitals = pd.Series(['Mumbai', 'Gandhinagar', 'Thiruvananthapuram'])** **data = {'State': states, 'Capital': capitals}** **df = pd.DataFrame(data)** **df.drop(index=1, inplace=True)** **print(df)**	

<table>
<tr><th>Q No</th><th colspan="2">Section-C (4X3 = 12 Marks)</th><th>Marks</th></tr>
<tr><td>29</td><td colspan="2">Rahul has recently invented a new type of solar-powered water purification system and is concerned about the possibility of someone illegally copying and selling his invention without his permission.
I. Explain Rahul the terms Intellectual Property & Intellectual Property Rights (IPR).
II. Under which specific category of IPR is Rahul's invention covered?
III. Describe the importance of IPR in safeguarding innovations.</td><td>3</td></tr>
<tr><td>30</td><td>(A)</td><td>Write a Python program to create a Pandas Series as shown below using a ndarray, where the subject names are the indices and the corresponding marks are the values in the series.
Mathematics 85
Science 90
English 78
History 88
OR
(B)
Write a Python program to create the Pandas DataFrame displayed below using a list of dictionaries.
Course Duration
0 Data Science 12
1 Artificial Intelligence 18
2 Web Development 6</td><td>3</td></tr>
<tr><td>31</td><td colspan="2">I. Write an SQL statement to create a table named EMPLOYEES, with the following specifications:
<table><tr><th>Column Name</th><th>Data Type</th><th>Key</th></tr><tr><td>EmployeeID</td><td>Numeric</td><td>Primary Key</td></tr><tr><td>EmpName</td><td>Varchar(25)</td><td></td></tr><tr><td>HireDate</td><td>Date</td><td></td></tr><tr><td>Salary_in_Lacs</td><td>Float(4,2)</td><td></td></tr></table>II. Write an SQL Query to insert the following data into the EMPLOYEES table: 101, Ravi Kumar, 2015-06-01, 1.70</td><td>2+1=3</td></tr>
</table>

32 (A) Consider the following tables: 3

Table 1: STUDENT, which stores **StudentID**, **Name**, and **Class**.

StudentID	Name	Class
1	Ankit	12
2	Priya	11
3	Rohan	12
4	Shreya	11
5	Rehan	12

Table 2: MARKS, which stores **StudentID**, **Subject**, and Score

StudentID	Subject	Score
1	Mathematics	85
2	Physics	78
3	Chemistry	88
4	Biology	81
6	Computer Science	93

Write appropriate SQL queries for the following:

I. List the names of students enrolled in Class 12, sorted in ascending order.

II. Display name of all subjects in uppercase where students scored more than 80 marks.

III. Display the names of students along with their subject and Score.

OR

(B) Consider the following table **EMPLOYEE**, which stores **EmployeeID**, **Name**, **Department and Salary**.

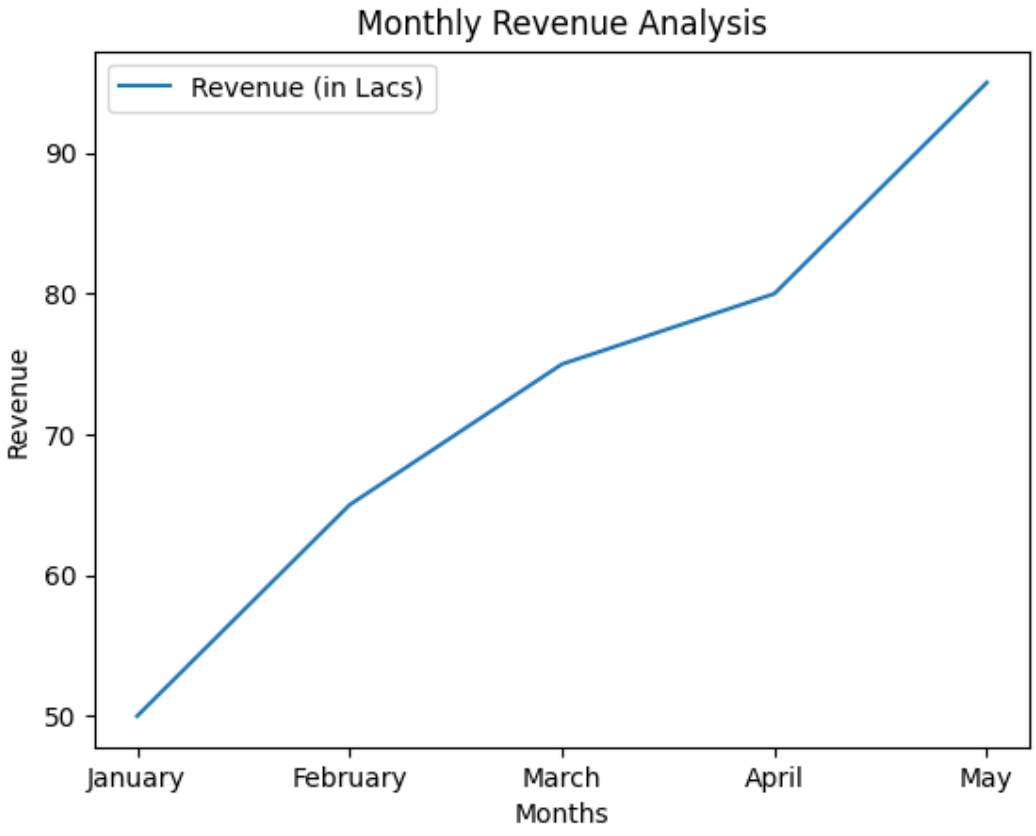
Table: EMPLOYEE

EmployeeID	**Name**	**Department**	**Salary**
101	Aman	IT	60000
102	Rahul	HR	50000
103	Priya	IT	70000
104	Neha	Finance	55000
105	Rahul	IT	60000

I. Which attribute in the Table can be considered as the Primary Key? Provide justification for your answer

		II. Write a suitable SQL query to add a new column, **Experience**, of numeric data type to the table. III. Write the output of the following SQL Query. **SELECT Department, COUNT(*) FROM Employee GROUP BY Department;**	
Q No.		**Section-D (2X4 = 8 Marks)**	**Marks**
33		Rohan, a business analyst, is working on a Python program to create a line graph that represents the monthly revenue (in lakhs) of a company over five months. However, some parts of his code are incomplete. Help Rohan by filling in the blanks in the following Python program.	4

Month	Revenue (in Lacs)
January	50
February	65
March	75
April	80
May	95



Help Rohan to complete the code.

```
_____ as plt #Statement-1
Months = ['January', 'February', 'March', 'April', 'May']
Revenue = [50, 65, 75, 80, 95]
_____ #Statement-2
plt.xlabel('Months')
plt.ylabel('Revenue')
_____ #Statement-3
_____ #Statement-4
plt.legend()
plt.show()
```

I. Write the suitable code for the import statement in the blank space in the line marked as Statement-1.
II. Write the suitable code for the blank space in the line marked as Statement-2, which plots the line graph with the appropriate data and includes a label for the legend.
III. Fill in the blank in Statement-3 with the correct Python code to set the title of the graph.
IV. Fill in the blank in Statement-4 with the appropriate Python code to save the graph as an image file named **monthly_revenue.png**.

34 (A) Raghav, who works as a database designer, has created a table **Student** as shown below: (4)

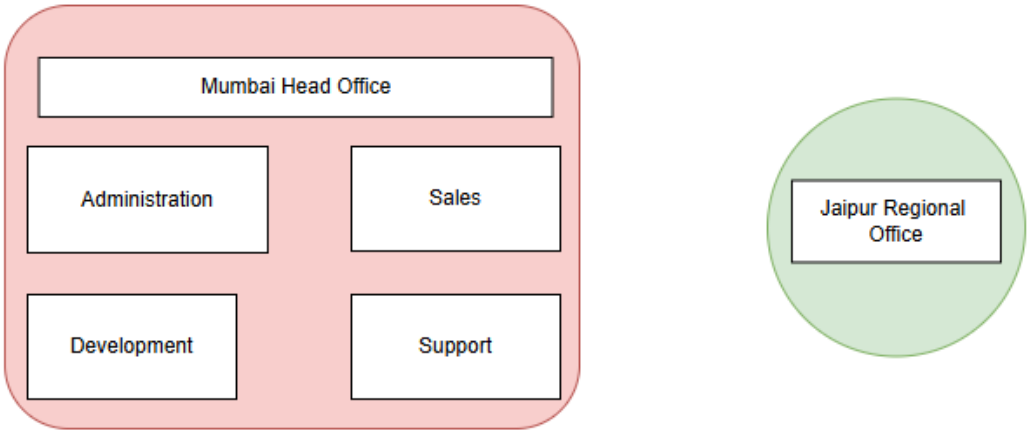
Table : Student

StudentID	Name	City	Marks	Admission_Date
101	Aarav Sharma	Delhi	85	2022-04-01
102	Priya Iyer	Mumbai	78	2021-05-15
103	Rohan Verma	Bangalore	92	2020-06-10
104	Simran Patel	Delhi	88	2022-03-20
105	Karan Yadav	Mumbai	75	2021-08-05

Write suitable SQL query for the following.

I. Show the Name and City of the students, both in uppercase, sorted alphabetically by Name.
II. Display the Student ID along with the name of the month in which the student was admitted to the school.
III. Calculate and display the average marks obtained by students.

	(B)	IV. Show the names of the cities and the number of students residing in the city. **OR** Consider the following table and write the output of the following SQL Queries. **Table : Student** **StudentID** | **Name** | **DateofBirth** | **Marks** | **City** 301 | Aryan | 15-03-2005 | 88 | Delhi 302 | Ayesha | NULL | 90 | NULL 304 | Aditi | NULL | 85 | Pune 305 | Rajesh | 11-01-2006 | 72 | NULL 306 | Maria | 29-04-2005 | 95 | Chennai Write the output of the following SQL Queries. **I. SELECT Name, LENGTH(Name) FROM Student WHERE StudentID < 303;** **II. SELECT lower(Name) FROM Student WHERE MONTH(DateofBirth)= 3;** III. **SELECT AVG(Marks) FROM Student;** IV. **SELECT Name, Marks FROM Student WHERE Marks BETWEEN 90 AND 100;**	
Q No.	**Section-E (3X5 = 15 Marks)**		**Marks**
35	ABC Pvt Ltd. is a leading global IT solutions provider. The company's head office is located in Mumbai while its Regional Office is in Jaipur. The Mumbai office consists of four departments: Administration, Sales, Development, and Support.		5



The distances between these departments, as well as between Mumbai and Jaipur, are as follows:

Administration to Sales	60 meters
Administration to Development	90 meters
Administration to Support	120 meters
Sales to Development	50 meters
Sales to Support	70 meters
Development to Support	45 meters
Mumbai Office to Jaipur Office	1400 kilometers

The number of computers in each department/office is as follows:

Administration	120
Sales	40
Development	70
Support	25
Jaipur Office	50

As a network engineer, you have to propose solutions for various queries listed from I to V.

I. Suggest the most suitable department in the Mumbai Office Setup, to install the server. Also, give a reason to justify your suggested location.

II. Draw a suitable cable layout of wired network connectivity between the departments in the Mumbai Office.

III. Which hardware device will you suggest to connect all the computers within each department?

	IV. Suggest the most appropriate type of network (LAN, MAN, WAN) to connect the Mumbai Head Office and Jaipur Regional Office. V. When a signal is transmitted through a wire from Administration department to Support department, its strength reduces. Which device would you suggest the company use to solve this problem?		
36	Consider the DataFrame **df** shown below. **df** Write Python statements for the following tasks: I. Print the last three rows of the DataFrame **df**. II. Add a new column named "**Experience**" with values [5, 8, 10, 6, 7]. III. Delete the column "**Salary**" from the DataFrame. IV. Rename the column "**Department**" to "**Dept**". V. Display only the "**Name"** and "**Salary"** columns from the DataFrame.		5
37	(A)	Write suitable **SQL** query for the following: I. To extract the first five characters from the **product_code** column in the **Products** table. II. To display the total number of orders from **Order_Id** column in the **Orders** table. III. To display the year of the order dates from the **order_date** column in the **Orders** table. IV. To display the **Address** column from the **Customers** table after removing leading and trailing spaces V. To display the current date. **OR**	5
	(B)	Write suitable **SQL** query for the following:	

	Name	Department	Salary
0	Rohan Sharma	IT	75000
1	Meera Kapoor	HR	68000
2	Aarav Singh	Finance	85000
3	Nisha Singh	Marketing	72000
4	Aditya Verma	IT	80000

		I. To display the total number of characters in the string **DatabaseSystems.** II. Find the position of the first occurrence of the letter 'a' in the **Product_Name** column of the **Products** table. III. Calculate the square of the Amount for each transaction in the **Tran_Amount** column of the **Transactions** table. IV. To display the average salary from the **Salaries** column in the **Employees** table. V. Display the total sum of the Salary from the **Salary** column in the **Employees** table.	

INFORMATICS PRACTICES – Code No. 065
MARKING SCHEME
Class - XII - (2025-26)

Time Allowed: 3 Hrs. **Maximum Marks: 70**

Q No.	Section-A	Marks
1	True *(1 mark for correct answer)*	1
2	(B) 5 *(1 mark for correct answer)*	1
3	(D) Phishing *(1 mark for correct answer)*	1
4	(A) df.to_csv() *(1 mark for correct answer)*	1
5	(A) Modem *(1 mark for correct answer)*	1
6	(A) Rounds the number to the nearest integer *(1 mark for correct answer)*	1
7	(B) Copyright *(1 mark for correct answer)*	1
8	(D) Consecutive integers starting from 0 *(1 mark for correct answer)*	1
9	(D) 4 *(1 mark for correct answer)*	1
10	(C) Internet Telephony *(1 mark for correct answer)*	1
11	(B) COUNT(column_name) *(1 mark for correct answer)*	1
12	(C) The result has all indices, with missing values filled as NaN *(1 mark for correct answer)*	1
13	(C) Information Technology Act, 2000 *(1 mark for correct answer)*	1
14	(A) ORDER BY *(1 mark for correct answer)*	1
15	(B) df.loc[:2] *(1 mark for correct answer)*	1

16	(C) Mesh *(1 mark for correct answer)*		1
17	(C) To find the position of a substring in a string *(1 mark for correct answer)*		1
18	(B) pd.DataFrame() *(1 mark for correct answer)*		1
19	(C) UPPER() *(1 mark for correct answer)*		1
20	(A) Both A and R are True, and R correctly explains A. *(1 mark for correct answer)*		1
21	(A) Both A and R are True, and R correctly explains A. *(1 mark for correct answer)*		1
Q No.	**Section-B**		**Marks**
22	(A)	A DataFrame is a 2-Dimensional labeled data structure with rows and columns. Property: Flexible Size - Rows and Columns can be added or deleted after creation of DataFrame. *(1 mark for correct definition)* *(1 mark for correct Property)* **OR**	2
	(B)	A Series is 1-dimensional, while a DataFrame is 2-dimensional. Series is size immutable while DataFrame is size mutable. *(1 mark for each correct difference)*	
23	E-waste refers to discarded electronic devices like computers and phones. Impact: E-waste releases toxic chemicals into the soil and water, harming the environment. *(1 mark for correct definition)* *(1 mark for correct impact)*		2
24	pandas {'January': 31, 'February': 28, 'March': 31} Series *(1/2 mark for pandas)* *(1 mark for dictionary)* *(1/2 mark for Series)*		2

25	(A)	Web Server : It is a computer software that accepts client request and responds with required content or error message. Web Hosting: It is a service that stores and maintains a website's files on a server so that the website is accessible online. *(1 mark for role of Web Sever)* *(1 mark for role of Web Hosting)* **OR**	2
	(B)	VoIP allows voice communication over the internet. Benefit: Cost-effective *(1 mark for correct definition)* *(1 mark for correct benefit)*	
26	I. SELECT DAYNAME('2026-01-01'); II. SELECT INSTR('Incredible India', 'India'); *(1 mark for each correct query)*		2
27	Digital footprints are traces of a person's online activity. Active Digital Footprint: Intentional posts or uploads. Passive Digital Footprint: Unintentional data collected (e.g., location tracking). *(1 mark for correct definition)* *(1 mark for correct difference)*		2
28	(A)	StuName Score 0 Abhay 85 1 Ananya 92 2 Javed 88 *(2 marks for correct output)* **OR**	2
	(B)	State Capital 0 Maharashtra Mumbai 2 Kerala Thiruvananthapuram *(2 marks for correct output)*	
Q No	**Section-C**		**Marks**
29	I. Intellectual Property (IP) refers to creations of the mind like literary works, inventions etc. Intellectual Property Rights (IPR) are legal rights granted to creators for their original work. II. Rahul's invention will be covered under Patent.		3

	III. Intellectual Property Rights (IPR) protect innovations by granting creators exclusive control over their inventions, preventing unauthorized use and ensuring financial rewards, which encourages further creativity and economic growth. *(1 mark for each correct answer)*		
30	(A)	import pandas as pd import numpy as np marks = np.array([85, 90, 78, 88]) series = pd.Series(marks, index=['Mathematics', 'Science', 'English', 'History']) print(series) *(1 mark for correct import statement)* *(1 mark for correct creation of ndarray)* *(1 mark for correct creation of series)*	3
		OR	
	(B)	import pandas as pd d1 = {'Course': 'Data Science', 'Duration': 12} d2 = {'Course': 'Artificial Intelligence', 'Duration': 18} d3 = {'Course': 'Web Development', 'Duration': 6} data = [d1, d2, d3] df = pd.DataFrame(data) print(df) *(1 mark for correct import statement)* *(1 mark for correct list of dictionaries)* *(1 mark for correct creation of dataframe)*	
31	I. CREATE TABLE EMPLOYEES (EmployeeID NUMERIC PRIMARY KEY, EmpName VARCHAR(25), HireDate DATE, Salary_in_Lacs FLOAT(4,2)); *(2 mark for correct creation of Table)* *II.* INSERT INTO EMPLOYEES (EmployeeID, EmpName, HireDate, Salary_in_Lacs) VALUES (101, 'Ravi Kumar', '2015-06-01', 1.70);		3

(1 Mark for correct insert Query)

32 (A)

I. SELECT Name FROM STUDENT WHERE Class = 12 ORDER BY Name ASC;

II. SELECT UPPER(Subject) FROM MARKS WHERE Score > 80;

III. SELECT Name, Subject, Score
FROM STUDENT JOIN MARKS
ON STUDENT.StudentID = MARKS.StudentID;

(1 mark for each correct query)

OR

(B)

I. EmployeeID can be considered as Primary Key because it uniquely identifies each employee in the table.

II. ALTER TABLE Employee ADD Experience INT;

III.

Department	COUNT(*)
IT	3
HR	1
Finance	1

(1 mark for each correct answer)

3

Q No.	**Section-D**	**Marks**

33

I. import matplotlib.pyplot

II. plt.plot(Months, Revenue, label='Revenue (in Lacs')

III. plt.title('Monthly Revenue Analysis')

IV. plt.savefig('monthly_revenue.png')

(1 mark for each correct answer)

4

34 A.

I. SELECT UPPER(Name), UPPER(City) FROM Student ORDER BY Name;

II. SELECT StudentID, MONTHNAME(Admission_Date) FROM Student;

III. SELECT AVG(Marks)FROM Student;

IV. SELECT City, COUNT(*) FROM Student GROUP BY City;

(1 mark for each correct query)

OR

B.

I.

Name	**LENGTH(Name)**
Aryan	5
Ayesha	6

4

II.

lower(Name)
aryan

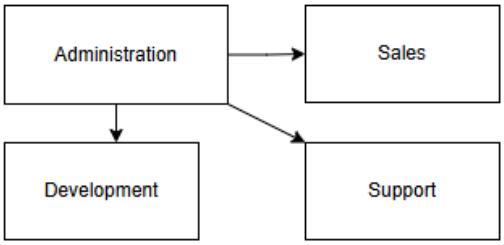
III.

AVG(Marks)
86.0000

IV.

Name	Marks
Ayesha	90
Maria	95

(1 mark for each correct output)

Q No.	Section-E	Marks
35	I. The server should be installed in the Administration department as it has the most number of computers. II. Cable Layout  III. Switch/Hub IV. WAN (Wide Area Network), as the offices are located in different cities. V. Repeater *(1 mark for each correct answer)*	5
36	I. print(df.tail(3)) II. df['Experience'] = [5, 8, 10, 6, 7] III. df.drop(columns=['Salary'], inplace=True) IV. df.rename(columns={'Department': 'Dept'}, inplace=True) V. print(df[["Name", "Salary"]]) *(1 mark for each correct answer)*	5
37	A. I. SELECT LEFT(product_code, 5) FROM Products; II. SELECT COUNT(Order_Id) FROM Orders; III. SELECT YEAR(order_date) FROM Orders; IV. SELECT TRIM(Address) FROM Customers;	5

		V. SELECT DATE(NOW()); *(1 mark for each correct query)* **OR**	
	B.	I. SELECT LENGTH('DatabaseSystems'); II. SELECT INSTR(Product_Name, 'a') FROM Products; III. SELECT POWER(Tran_Amount, 2) FROM Transactions; IV. SELECT AVG(Salaries) FROM Employees; V. SELECT SUM(Salary) FROM Employees; *(1 mark for each correct query)*	

SAMPLE QUESTION PAPER (THEORY)
CLASS XII SESSION: 2024-25
INFORMATICS PRACTICES (065)

Time allowed: 3 Hours **Maximum Marks:70**

General Instructions:

- Please check this question paper contains 37 questions.
- All questions are compulsory. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions
- The paper is divided into 5 Sections- A, B, C, D and E.
- Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
- Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
- Section C consists of 4 questions (29 to 32). Each question carries 3 Marks.
- Section D consists of 2 case study type questions (33 to 34). Each question carries 4 Marks.
- Section E consists of 3 questions (35 to 37). Each question carries 5 Marks.
- All programming questions are to be answered using Python Language only.
- In case of MCQ, text of the correct answer should also be written.

Q No.	Section-A (21 x 1 = 21 Marks)	Marks
1	State whether the following statement is True or False: Slicing can be used to extract a specific portion from a Pandas Series.	1
2	The purpose of **`WHERE`** clause in a SQL statement is to: (A) Create a table (B) Filter rows based on a specific condition (C) Specify the columns to be displayed (D) Sort the result based on a column	1
3	Identify the networking device responsible for routing data packets based on their destination addresses. (A) Modem (B) Hub (C) Repeater (D) Router	1

4	Identify the SQL command used to delete a relation (table) from a relational database. (A) DROP TABLE (B) REMOVE TABLE (C) DELETE TABLE (D) ERASE TABLE	1
5	e-waste refers to: (A) Software that has become obsolete (B) Data that has been deleted from a storage device (C) Viruses that infect computers (D) Electronic devices that are no longer in use	1
6	Which of the following Python statements can be used to select a column **`column_name`** from a DataFrame **`df`** ? (A) df.getcolumn('column_name') (B) df['column_name'] (C) df.select('column_name') (D) df(column_name)	1
7	By default, the plot() function of Matplotlib draws a _____ plot. (A) histogram (B) column (C) bar (D) line	1
8	State whether the following statement is True or False: In SQL, the **`HAVING`** clause is used to apply filter on groups formed by the **`GROUP BY`** clause.	1
9	Which of the following Python statements is used to import data from a CSV file into a Pandas DataFrame (Note: pd is an alias for pandas)? (A) pd.open_csv('filename.csv') (B) pd.read_csv('filename.csv') (C) pd.load_csv('filename.csv') (D) pd.import_csv('filename.csv')	1
10	What is plagiarism?	1

	(A) Using copyrighted material without giving proper acknowledgement to the source (B) Downloading illegal software. (C) Spreading misinformation online. (D) Hacking into computer systems.	
11	Fill in the Blank The **`COUNT(*)`** function provides the total number of _____ within a relation (table) in a relational database. (A) Columns (B) Unique values (C) Not-null values (D) Rows	1
12	In which of the network topologies do all devices connect to a central point, such as a switch or hub? (A) Star (B) Bus (C) Tree (D) Mesh	1
13	In a Pandas DataFrame, if the **`tail()`** function is used without specifying the optional argument indicating the number of rows to display, what is the default number of rows displayed, considering the DataFrame has 10 entries? (A) 0 (B) 1 (C) 4 (D) 5	1
14	Identify the type of cybercrime that involves sending fraudulent emails to deceive individuals into revealing sensitive information. (A) Hacking (B) Phishing (C) Cyberbullying (D) Cyberstalking	1
15	While creating a Series using a dictionary, the keys of the dictionary become: (A) Values of the Series	1

	(B) Indices of the Series (C) Data type of the Series (D) Name of the Series	
16	Match the following SQL functions/clauses with their descriptions: SQL Function / Description P. `MAX()` — 1. Find the position of a substring in a string. Q. `SUBSTRING()` — 2. Returns the maximum value in a column. R. `INSTR()` — 3. Sorts the data based on a column. S. `ORDER BY` — 4. Extracts a portion of a string. (A) P-2, Q-4, R-3, S-1 (B) P-2, Q-4, R-1, S-3 (C) P-4, Q-3, R-2, S-1 (D) P-4, Q-2, R-1, S-3	1
17	Fill in the Blank Boolean indexing in Pandas DataFrame can be used for _____. (A) Creating a new DataFrame (B) Sorting data based on index labels (C) Joining data using labels (D) Filtering data based on condition	1
18	Which Matplotlib plot is best suited to represent changes in data over time? (A) Bar plot (B) Histogram (C) Line plot (D) Histogram & Bar plot	1
19	Which type of network covers a small geographical area like a single office, building, or school campus? (A) PAN (B) MAN (C) LAN (D) WAN	1
	Q-20 and Q-21 are Assertion (A) and Reason (R) Type questions. Choose the correct option as:	

	(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**		
20	**Assertion (A):** We can add a new column in an existing DataFrame. **Reason (R):** DataFrames are size mutable.		1
21	**Assertion (A):** In SQL, **`INSERT INTO`** is a Data Definition Language (DDL) Command. **Reason (R):** DDL commands are used to create, modify, or remove database structures, such as tables.		1
Q No.	**Section-B (7 x 2 = 14 Marks)**		**Marks**
22	(A)	What is a Series in Python Pandas? Also, give a suitable example to support your answer. **OR**	2
	(B)	What does the term 'library' signify in Python? Mention one use for each of the following libraries: • Pandas • Matplotlib	
23	What are intellectual property rights (IPR), and why are they important in the digital world?		2
24	Consider the string: "**`Database Management System`**". Write suitable SQL queries for the following: I. To extract and display "**`Manage`**" from the string. II. Display the position of the first occurrence of "**`base`**" in the given string.		2
25	(A)	What is Internet and how does it differ from World Wide Web (WWW)? **OR**	2
	(B)	Explain the concept of browser cookies and mention one advantage of using them.	

26	Define the term Primary Key in a database. Explain how it is different from a Candidate Key.		2
27	Mention two health concerns associated with excessive use of Digital Devices.		2

28	(A)	Sneha is writing a Python program to create a DataFrame using a list of dictionaries. However, her code contains some mistakes. Identify the errors, rewrite the correct code, and underline the corrections made.
		`import Pandas as pd`
		`D1 = {'Name': 'Rakshit', 'Age': 25}`
		`D2 = {'Name': 'Paul', 'Age': 30}`
		`D3 = {'Name': 'Ayesha", 'Age': 28}`
		`data = [D1,D2,D3)`
		`df = pd.Dataframe(data)`
		`print(df)`
		OR	

	(B)	Complete the given Python code to get the required output (ignore the dtype attribute) as
		Output:
		Tamil Nadu Chennai
		Uttar Pradesh Lucknow
		Manipur Imphal
		
		Code:
		`import _____ as pd`
		`data = ['Chennai','_____','Imphal']`
		`indx = ['Tamil Nadu','Uttar Pradesh','Manipur']`
		`s = pd.Series(_____, indx)`
		`print(_____)`
			2

Q No	**Section-C (4 x 3 = 12 Marks)**		**Marks**
29	Ayesha's family is replacing their old computer with a new one. They decide to throw the old computer in a nearby empty field/plot. I. Explain any one potential environmental hazard associated with improper e-waste disposal. II. Suggest one responsible way to Ayesha's family for proper disposal of their old computer. III. Describe the importance of recycling in e-waste management.		3

30 (A) Write a Python program to create the following DataFrame using a list of dictionaries. — 3

	Product	Price
0	Laptop	60000
1	Desktop	45000
2	Monitor	15000
3	Tablet	30000

OR

(B) Write a Python Program to create a Pandas Series as shown below using a dictionary. Note that the left column indicates the indices and the right column displays the data.

Russia	Moscow
Hungary	Budapest
Switzerland	Bern

31 I. Write an SQL statement to create a table named **STUDENTS**, with the following specifications: — 2+1=3

Column Name	Data Type	Key
StudentID	Numeric	Primary Key
FirstName	Varchar(20)	
LastName	Varchar(10)	
DateOfBirth	Date	
Percentage	Float(10,2)	

II. Write SQL Query to insert the following data in the Students Table
1, Supriya, Singh, 2010-08-18, 75.5

32 (A) Consider the following tables: — 3

Table 1:

EMPLOYEE which stores Employee ID (**EMP_ID**), Employee Name (**EMP_NAME**), Employee City (**EMP_CITY**)

Table 2:

PAYROLL which stores Employee ID (**EMP_ID**), Department (**DEPARTMENT**), Designation (**DESIGNATION**), and Salary (**SALARY**) for various employees.

Note: Attribute names are written within brackets.

Table: EMPLOYEE

EMP_ID	EMP_NAME	EMP_CITY

1	ABHINAV	AGRA
2	KABIR	FARIDABAD
3	ESHA	NOIDA
4	PAUL	SEOUL
5	VICTORIA	LONDON

Table: PAYROLL

EMP_ID	DEPARTMENT	DESIGNATION	SALARY
1	SALES	MANAGER	75000
2	SALES	ASSOCIATE	50000
3	ENGINEERING	MANAGER	95000
4	ENGINEERING	ENGINEER	70000
5	MARKETING	MANAGER	65000

Write appropriate SQL queries for the following:

I. Display department-wise average Salary.

II. List all designations in the decreasing order of Salary.

III. Display employee name along with their corresponding departments.

OR

(B) Consider the following tables:

Table 1:

ATHLETE, which stores **AthleteID**, **Name, Country**. The table displays basic information of the athletes

Table 2:

MEDALS, which stores **AthleteID**, **Sport**, and **Medals**. The table displays the number of medals won by each athlete in their respective sports.

Table: ATHLETE

AthleteID	Name	COUNTRY
101	Arjun	INDIA
102	Priya	INDIA
103	Asif	UAE
104	Rozy	USA
105	David	DENMARK

Table: MEDALS

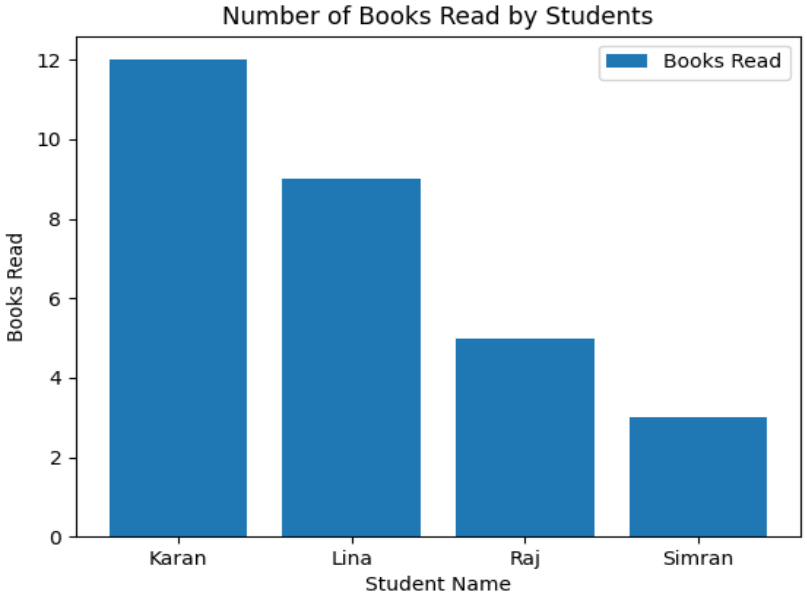
AthleteID	Sport	Medals
101	Swimming	8
102	Track	3
103	Gymnastics	5
104	Swimming	2
105	Track	6

Write appropriate SQL queries for the following:

		I. Display the sports-wise total number of medals won. II. Display the names of all the Indian athletes in uppercase. III. Display the athlete name along with their corresponding sports	
Q No.		**Section-D (2 x 4 = 8 Marks)**	**Marks**
33		During a practical exam, a student Ankita has to fill in the blanks in a Python program that generates a bar chart. This bar chart represents the number of books read by four students in one month.	4

Student Name	Books Read
Karan	12
Lina	9
Raj	5
Simran	3

Help Ankita to complete the code.




```
import _____ as plt #Statement-1
students = ['Karan', 'Lina', 'Raj', 'Simran']
books_read = [12, 9, 5, 3]
plt.bar( students, _____, label='Books Read') #Statement-2
plt.xlabel('Student Name')
plt._____('Books Read') #Statement-3
plt.legend()
plt.title('_____') #Statement-4
plt.show()
```

I. Write the suitable code for the import statement in the blank space in the line marked as Statement-1.

II. Refer to the graph shown above and fill in the blank in Statement-2 with suitable Python code.

III. Fill in the blank in Statement-3 with the name of the function to set the label on the y-axis.

IV. Refer the graph shown above and fill the blank in Statement-4 with suitable Chart Title.

34 (A) Rahul, who works as a database designer, has developed a database for a bookshop. This database includes a table *BOOK* whose column (attribute) names are mentioned below: 4

BCODE: Shows the unique code for each book.
TITLE: Indicates the book's title.
AUTHOR: Specifies the author's name.
PRICE: Lists the cost of the book.

Table: **BOOK**

BCODE	TITLE	AUTHOR	PRICE
B001	MIDNIGHT'S CHILDREN	SALMAN RUSHDIE	500
B002	THE GOD OF SMALL THINGS	ARUNDHATI ROY	450
B003	A SUITABLE BOY	VIKRAM SETH	600
B004	THE WHITE TIGER	ARAVIND ADIGA	399
B005	TRAIN TO PAKISTAN	KHUSHWANT SINGH	350

I. Write SQL query to display book titles in lowercase.

II. Write SQL query to display the highest price among the books.

III. Write SQL query to display the number of characters in each book title.

IV. Write SQL query to display the Book Code and Price sorted by Price in descending order.

OR

(B) Dr. Kavita has created a database for a hospital's pharmacy. The database includes a table named **MEDICINE** whose column (attribute) names are mentioned below:

MID: Shows the unique code for each medicine.

MED_NAME: Specifies the medicine name

SUPP_CITY: Specifies the city where the supplier is located.

STOCK: Indicates the quantity of medicine available.

DEL_DATE: Specifies the date when the medicine was delivered.

Table: **MEDICINE**

MID	MED_NAME	SUPP_CITY	STOCK	DEL_DATE
M01	PARACETAMOL	MUMBAI	200	2023-06-15
M02	AMOXICILLIN	KOLKATA	50	2023-03-21
M03	COUGH SYRUP	BENGALURU	120	2023-02-10
M04	INSULIN	CHENNAI	135	2023-01-25
M05	IBUPROFEN	AHMEDABAD	30	2023-04-05

Write the output of the following SQL Queries.

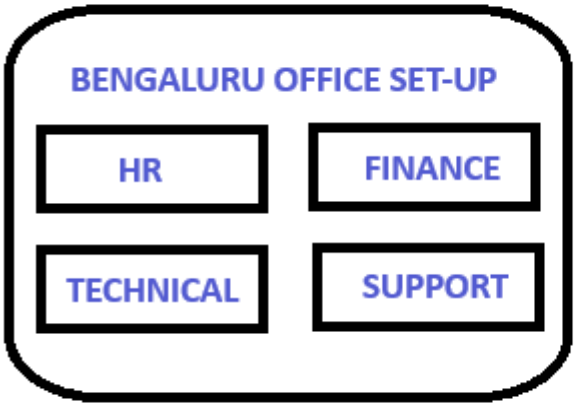
I. Select LENGTH(MED_NAME) from MEDICINE where STOCK > 100;

II. Select MED_NAME from MEDICINE where month(DEL_DATE) = 4;

III. Select MED_NAME from MEDICINE where STOCK between 120 and 200;

IV. Select max(DEL_DATE) from MEDICINE;

Q No.	Section-E (3 x 5 = 15 Marks)	Marks
35	ABC Pvt. Ltd., a multinational technology company, is looking to establish its Indian Head Office in Bengaluru, and a regional office branch in Lucknow. The Bengaluru head office will be organized into four departments: HR, FINANCE, TECHNICAL, AND SUPPORT. As a network engineer, you have to propose solutions for various queries listed from I to V.	5





The shortest distances between the departments/offices are as follows:

HR TO FINANCE	65 M
HR TO TECHNICAL	80 M
HR TO SUPPORT	70 M
FINANCE TO TECHNICAL	60 M
FINANCE TO SUPPORT	75 M
TECHNICAL TO SUPPORT	50 M
BENGALURU OFFICE TO LUCKNOW	1900 KM

The number of computers in each department/office is as follows:

HR	175
FINANCE	35
TECHNICAL	50
SUPPORT	15
LUCKNOW OFFICE	40

I. Suggest the most suitable department in the Bengaluru Office Setup, to install the server. Also, give a reason to justify your suggested location.

II. Draw a suitable cable layout of wired network connectivity between the departments in the Bengaluru Office.

III. Which networking device would you suggest the company to purchase to interconnect all the computers within a department in Bengaluru Office?

IV. The company is considering establishing a network connection between its Bengaluru Head Office and Lucknow regional office. Which

type of network—LAN, MAN, or WAN—will be created? Justify your answer.

V. The company plans to develop an interactive website that will enable its employees to monitor their performance after login. Would you recommend a static or dynamic website, and why?

36 Consider the DataFrame *df* shown below.

	MovieID	Title	Year	Rating
0	1	LAGAAN	2001	8.4
1	2	TAARE ZAMEEN PAR	2007	8.5
2	3	3 IDIOTS	2009	8.4
3	4	DANGAL	2016	8.4
4	5	ANDHADHUN	2018	8.3

Write Python statements for the DataFrame **`df`** to: 5

I. Print the first two rows of the DataFrame **`df.`**

II. Display titles of all the movies.

III. Remove the column rating.

IV. Display the data of the *'***`Title`***'* column from indexes 2 to 4 (both included)

V. Rename the column name **`'Title'`** to **`'Name'`**.

37 (A) Write suitable SQL query for the following:

I. To display the average score from the **`test_results`** column (attribute) in the **`Exams`** table

II. To display the last three characters of the **`registration_number`** column (attribute) in the **`Vehicles`** table. (Note: The registration numbers are stored in the format DL-01-AV-1234)

III. To display the data from the column (attribute) **`username`** in the **`Users`** table, after eliminating any leading and trailing spaces. 5

IV. To display the maximum value in the **`salary`** column (attribute) of the **`Employees`** table.

V. To determine the count of rows in the **`Suppliers`** table.

(B) **OR**

Write suitable SQL query for the following:

I. Round the value of pi (3.14159) to two decimal places.

		II. Calculate the remainder when 125 is divided by 8. III. Display the number of characters in the word 'NewDelhi'. IV. Display the first 5 characters from the word 'Informatics Practices'. V. Display details from **'email'** column (attribute), in the **'Students'** table, after removing any leading and trailing spaces.	

MARKING SCHEME
CLASS XII SESSION: 2024-25
INFORMATICS PRACTICES (065)

Time allowed: 3 Hours **Maximum Marks:70**

Q No.	Section-A	Marks
1	True *(1 mark for correct answer)*	1
2	(B). Filter rows based on a specific condition *(1 mark for correct answer)*	1
3	(D). Router *(1 mark for correct answer)*	1
4	(A). DROP TABLE *(1 mark for correct answer)*	1
5	(D). Electronic devices that are no longer in use *(1 mark for correct answer)*	1
6	(B). df['column_name'] *(1 mark for correct answer)*	1
7	(D). line *(1 mark for correct answer)*	1
8	True *(1 mark for correct answer)*	1
9	(B). pd.read_csv('filename.csv') *(1 mark for correct answer)*	1
10	(A) Using copyrighted material without giving proper acknowledgement to the source *(1 mark for correct answer)*	1
11	(D). Rows *(1 mark for correct answer)*	1
12	(A). Star	1

	(1 mark for correct answer)		
13	(D). 5 *(1 mark for correct answer)*		1
14	(B). Phishing *(1 mark for correct answer)*		1
15	(B). Indices of the Series *(1 mark for correct answer)*		1
16	(B). P-2, Q-4, R-1, S-3 *(1 mark for correct answer)*		1
17	(D). Filtering data based on condition *(1 mark for correct answer)*		1
18	(C). Line plot *(1 mark for correct answer)*		1
19	(C). LAN *(1 mark for correct answer)*		1
20	(A). Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A) *(1 mark for correct answer)*		1
21	(D). Assertion (A) is False, but Reason (R) is True *(1 mark for correct answer)*		1
Q No.	**Section-B (7 x 2 = 14 Marks)**		**Marks**
22	(A)	A Series is a one-dimensional array containing a sequence of values of any data type (int, float, list, string, etc) which by default have numeric data labels starting from zero. We can imagine a Pandas Series as a column in a spreadsheet. An example of a series containing the names of students is given below: Index Value 0 Arnab 1 Samridhi 2 Ramit 3 Divyam *(1 mark for correct definition)*	2

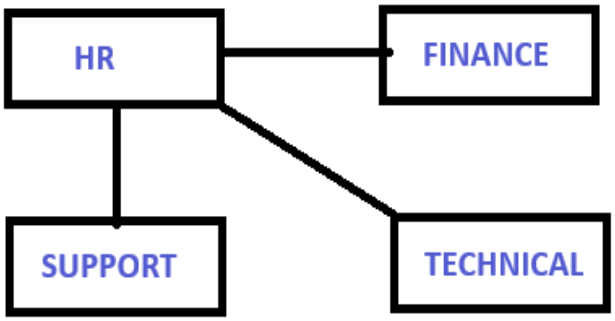
		(1 mark for correct example) **OR**	
	(B)	Library: A collection of modules providing functionalities for specific tasks. Pandas: Used for data analysis Matplotlib: Used for creating plots *(1 mark for correct definition)* *(1/2 mark each for correct use of each library)*	
23		**Intellectual Property Rights (IPR)** These are legal rights that protect the creations of the human intellect. The nature of these works can be artistic, literary or technical etc. **Importance in the digital world** These rights help prevent the unauthorized use or reproduction of digital content and ensure that creators are fairly compensated and incentivized for their original work. *(1 mark for correct definition)* *(1 mark for correct importance)*	2
24		I. SELECT SUBSTRING('Database Management System', 10, 6); *II.* SELECT INSTR('Database Management System', 'base'); *(1 mark for each correct query)*	2
25	(A)	The Internet is a vast network of interconnected computer networks facilitating global communication and data exchange. The World Wide Web (WWW), on the other hand, is a system of interlinked hypertext documents accessed via the Internet. *(1 mark for correct definition)* *(1 mark for correct difference)* **OR**	2
	(B)	Browser cookies: Small pieces of data stored on our digital devices by websites to remember information and personalize our experience. Advantage: Improve user experience by remembering preferences, like our preferred language and other settings. *(1 mark for correct definition)* *(1 mark for correct advantage)*	

26	Primary Key : A set of attributes that can uniquely identify each row in a table (relation). It must contain unique values and cannot be null. **How it differs from Candidate Key** There can be multiple Candidate Keys in a table (relation), but only one of them is selected as Primary Key. *(1 mark for correct definition)* *(1 mark for correct difference)*		2
27	Two health concerns due to excessive use of Digital Devices: a) Eye strain and vision problems. b) Musculoskeletal issues like neck and back pain. *(1 mark for each correct health concern)*		2
28	(A)	import pandas as pd D1 = {'Name': 'Rakshit', 'Age': 25} D2 = {'Name': 'Paul', 'Age': 30} D3 = {'Name': 'Ayesha', 'Age': 28} data = [D1, D2, D3] df = pd.DataFrame(data) print(df) Changes Made : i. Changed Pandas to pandas. ii. Corrected mismatched string quotation marks iii. Corrected the closing parenthesis in the list data. iv. Changed Dataframe to DataFrame. *(1/2 mark for each correct correction and underlining)*	2
		OR	
	(B)	import pandas as pd data = ['Chennai', 'Lucknow', 'Imphal'] indx = ['Tamil Nadu','Uttar Pradesh','Manipur'] s = pd.Series(data, indx) print(s) *(1/2 mark for each correct fill in the blank)*	

Q No	**Section-C (4 x 3 = 12 Marks)**		**Marks**
29	I. E-waste can release harmful substances like lead and mercury into the environment. *(1 mark for correct answer)* II. They can donate or sell it to a certified e-waste recycling center. *(1 mark for correct answer)* III. Recycling e-waste helps conserve natural resources and reduces pollution. *(1 mark for correct answer)*		3
30	(A)	import pandas as pd d1 = {'Product': 'Laptop', 'Price': 60000} d2 = {'Product': 'Desktop', 'Price': 45000} d3 = {'Product': 'Monitor', 'Price': 15000} d4 = {'Product': 'Tablet', 'Price': 30000} data = [d1, d2, d3, d4] df = pd.DataFrame(data) print(df) *(1 mark for correct import statement)* *(1 mark for correct list of dictionary)* *(1 mark for correct creation of DataFrame)*	3
		OR	
	(B)	import pandas as pd data = {'Russia':'Moscow','Hungary':'Budapest','Switzerland':'Bern'} s = pd.Series(data) print(s) *(1 mark for correct import statement)* *(1 mark for correct dictionary)* *(1 mark for correct creation of Series)*	
31	I.	CREATE TABLE STUDENTS (StudentID NUMERIC PRIMARY KEY, FirstName VARCHAR(20),	3

		LastName VARCHAR(10), DateOfBirth DATE, Percentage FLOAT(10,2)); *(2 mark for correct creation of Table)* *II.* INSERT INTO STUDENTS (StudentID, FirstName, LastName, DateOfBirth, Percentage) VALUES (1, 'Supriya', 'Singh', '2010-08-18', 75.5); *(1 Mark for correct insert Query)*	
32	(A)	I. SELECT DEPARTMENT, AVG(SALARY) FROM PAYROLL GROUP BY DEPARTMENT; II. SELECT DESIGNATION FROM PAYROLL ORDER BY SALARY DESC; III. SELECT EMP_NAME, DEPARTMENT FROM EMPLOYEE E, PAYROLL P WHERE E.EMP_ID=P.EMP_ID; *(1 mark for each correct query)* **OR**	3
	(B)	I. SELECT SPORT,SUM(Medals) FROM MEDALS GROUP BY SPORT; II. SELECT UPPER(Name) FROM ATHLETE WHERE COUNTRY = 'INDIA'; III. SELECT NAME, SPORT FROM ATHLETE A, MEDALS M WHERE A.AthleteID= M.AthleteID; *(1 mark for each correct query)*	
Q No.		**Section-D (2 x 4 = 8 Marks)**	**Marks**
33		I. matplotlib.pyplot II. books_read III. ylabel IV. Number of Books Read by Students *(1 mark for each correct answer)*	4

<table>
<tr><td>34</td><td>(A)</td><td>I. SELECT LOWER(TITLE) FROM BOOK;
II. SELECT MAX(PRICE) FROM BOOK;
III. SELECT LENGTH(TITLE) FROM BOOK;
IV. SELECT BCODE, PRICE FROM BOOK ORDER BY PRICE DESC;
(1 mark for each correct answer)
OR
(B) I.
<table><tr><td>LENGTH(MED_NAME)</td></tr><tr><td>11</td></tr><tr><td>11</td></tr><tr><td>7</td></tr></table>II.
<table><tr><td>MED_NAME</td></tr><tr><td>IBUPROFEN</td></tr></table>III.
<table><tr><td>MED_NAME</td></tr><tr><td>PARACETAMOL</td></tr><tr><td>COUGH SYRUP</td></tr><tr><td>INSULIN</td></tr></table>IV.
<table><tr><td>max(DEL_DATE)</td></tr><tr><td>2023-06-15</td></tr></table>(1 mark for each correct answer)</td><td>4</td></tr>
<tr><td>Q No.</td><td colspan="2">Section-E (3 x 5 = 15 Marks)</td><td>Marks</td></tr>
<tr><td>35</td><td colspan="2">I. The server should be installed in the HR department as it has the most number of computers.
II. Star topology</td><td>5</td></tr>
</table>

<table>
<tr><td></td><td colspan="2"> 

III. Switch/Hub
IV. WAN (Wide Area Network) will be created as the offices are located in different cities.
V. A dynamic website is recommended as it can display the dynamic performance data (which differs from employee to employee) of each employee.
(1 mark for each correct answer)</td><td></td></tr>
<tr><td>36</td><td colspan="2">I. print(df.head(2))
II. print(df['Title'])
III. df = df.drop(‘Rating’, axis=1)
IV. print(df.loc[2:4,'Title'])
V. df.rename(columns={'Title':'Name'}, inplace=True)
(1 mark for each correct answer)</td><td>5</td></tr>
<tr><td>37</td><td>(A)</td><td>I. SELECT AVG(test_results) FROM Exams;
II. SELECT RIGHT(registration_number, 3) FROM Vehicles;
III. SELECT TRIM(username) FROM Users;
IV. SELECT MAX(salary) FROM Employees;
V. SELECT COUNT(*) FROM Suppliers;
(1 mark for each correct query)
OR
(B) I. SELECT ROUND(3.14159, 2);
II. SELECT MOD(125, 8);
III. SELECT LENGTH('NewDelhi');
IV. SELECT LEFT('Informatics Practices', 5);
V. SELECT TRIM(email) FROM Students;
(1 mark for each correct query)</td><td>5</td></tr>
</table>