

Informatics Practices (065) – Pre-board Examination (2025-26)

Answer Key & Marking Scheme

General Note: For programming/SQL answers, syntax may vary slightly. Award full marks for any logically correct and syntactically valid alternative.

Section-A (1 Mark each)

Q.No.	Answer	Explanation / Reason
1	False	DataFrames are mutable.
2	(C) 625	POW(5, 4) calculates 5 raised to the power of 4.
3	(C) Ransomware	The description matches a ransomware attack, where data is encrypted and a ransom is demanded.
4	(A) pd.read_csv('data.csv')	This is the standard pandas function to read a CSV file.
5	(C) Repeater	A repeater's primary function is to regenerate network signals to extend their range.
6	(B) 8	LENGTH("Database") counts the number of characters, which is 8.
7	(C) Trademark	Logos, brand names, and symbols are protected under Trademark law.
8	(B) Integer	The default index for a DataFrame is RangeIndex (a sequence of integers).
9	(A) 1	A table can have only one Primary Key, chosen from the set of candidate keys.
10	(B) VoIP	Skype and Zoom are Voice over IP (VoIP) communication services.
11	(A) COUNT(*)	COUNT(*) counts all rows, including those with NULL values.
12	(C) The result contains all indices, with missing values filled as NaN.	Pandas aligns data based on index during operations.
13	(A) IT Act, 2000	The Information Technology Act, 2000 is the primary law for digital transactions and cybercrime.
14	(C) GROUP BY	The GROUP BY clause is used to group rows that have the same values.
15	(A) df.loc[2:4]	.loc[] is label-based and includes the stop index (4). .iloc[] is position-based and excludes the stop index.
16	(D) Bus	In a Bus topology, all devices are connected to a single central cable.

17	(B) To change the capital alphabets to small alphabets in a string	LCASE() or LOWER() converts a string to lowercase.
18	(B) pd.Series([0]*5)	This creates a list [0, 0, 0, 0, 0] and passes it to the Series() constructor.
19	(D) SEEK()	SEEK() is not a standard SQL aggregate function.
20	(A) Both A and R are True, and R correctly explains A.	df.shape returns a tuple (rows, columns), which are the dimensions of the DataFrame.
21	(A) Both A and R are True, and R correctly explains A.	CREATE TABLE defines the structure of a database object, making it a DDL command.

Section-B (2 Marks each)

Q.No.	Answer	Marks Breakdown
22	<p>A Pandas Series is a one-dimensional labeled array capable of holding data of any type.</p> <p>Characteristic (Any one):</p> <ul style="list-style-type: none"> - It can hold data of any type (integer, string, float, etc.). - It has an associated index (axis labels). - It is homogeneous (all elements must be of the same data type). <p>OR</p> <p>Differences between Series and ndarray (Any two):</p> <ol style="list-style-type: none"> 1. A Series has an index (labels), while an ndarray only has integer positions. 2. Series operations automatically align data based on their index, unlike ndarrays which align based on position. 3. A Series can hold heterogeneous data (though it's stored as a single type), while an ndarray is strictly homogeneous. 	<p>1 (Definition) + 1 (Characteristic)</p> <p>OR</p> <p>1 (Diff 1) + 1 (Diff 2)</p>
23	<p>Plagiarism is the act of presenting someone else's work or ideas as your own without proper acknowledgment.</p> <p>Way to prevent it (Any one):</p> <ul style="list-style-type: none"> - Always cite your sources. - Use quotation marks for direct quotes. - Paraphrase information in your own words and still cite the original source. - Use plagiarism detection software. 	<p>1 (Definition) + 1 (Prevention method)</p>
24	<p>The completed code is:</p> <pre>import pandas as pd df_data = [['Colour', 25.0], ['Pencil', 12.5], ['Eraser', 2.5]] s = pd.Series(df_data) print(s)</pre>	<p>1 (Correct df_data) + 1 (Correct pd.Series)</p>

	<i>Note: The output will be a Series of lists. To get the exact output shown, it should likely be a DataFrame. However, the question explicitly asks to create a Series from the nested list.</i>	
25	<p>Web Server: A web server is a software/hardware that stores website files (HTML, CSS, images) and delivers them to users' browsers upon request using HTTP.</p> <p>Web Hosting: Web hosting is a service provided by companies that rent out space on their powerful, always-connected servers (web servers). Ananya needs to purchase a hosting plan and upload her website files to the hosting company's server. This makes her site available on the internet.</p> <p>OR</p> <p>Cloud Storage is a service model where data is stored, managed, and backed up remotely on servers owned by a hosting company, and made available to users over a network (typically the internet).</p> <p>Advantage (Any one):</p> <ul style="list-style-type: none"> - Accessibility: Data can be accessed from anywhere with an internet connection. - Cost-effective: Eliminates the need for purchasing and maintaining physical storage devices. - Reliability and redundancy: Data is replicated across multiple servers, preventing data loss. 	<p>1 (Web Server) + 1 (Web Hosting)</p> <p>OR</p> <p>1 (Definition) + 1 (Advantage)</p>
26	<p>I. SELECT MONTH('2026-07-15'); OR SELECT MONTHNAME('2026-07-15');</p> <p>II. SELECT RIGHT("Informatics", 3); OR SELECT SUBSTR("Informatics", -3);</p>	1 mark for each correct query.
27	<p>Cyber Stalking: The use of the internet or other electronic means to stalk or harass an individual, group, or organization. It often involves monitoring, false accusations, threats, and can lead to real-life stalking.</p> <p>Difference: Cyber bullying is aimed at humiliating or intimidating someone, often among peers. Cyber stalking is a more severe form of prolonged harassment with a potentially higher threat level, often done by an adult to a minor and can have legal consequences.</p>	1 (Definition) + 1 (Difference)
28	<p>Output (First Code):</p> <p>Item Cost 0 Laptop 55000 1 Mobile 25000 2 Tablet 30000</p> <p>OR</p>	2 marks for correct output.

	Output (Second Code): Country Currency 0 India Rupee 1 USA Dollar 3 Germany Euro <i>Note: The row with index 2 ('Japan') is dropped.</i>	
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Section-C (3 Marks each)

Q.No.	Answer	Marks Breakdown
29	<p>I. Intellectual Property (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce. Intellectual Property Rights (IPR) are the legal rights granted to the creator to protect their intellectual property for a certain period of time.</p> <p>II. Her mobile application is covered under Copyright (for the code) and potentially Patent (if the algorithm or method is novel and non-obvious).</p> <p>III. IPR protects software by preventing unauthorized copying, distribution, or modification. It gives the creator exclusive rights to use, sell, or license their creation, ensuring they can earn recognition and financial benefit from it.</p>	1 (I) + 1 (II) + 1 (III)
30	<p>Code (Using Dictionary): import pandas as pd data = {'Raghav': 12, 'Satvik': 16, 'Virnda': 15, 'Heena': 16} s = pd.Series(data) print(s)</p> <p style="text-align: center;">OR</p> <p>Code (List of Dictionaries): import pandas as pd data = [{'Language': 'Python', 'Users (in Millions)': 10}, {'Language': 'Java', 'Users (in Millions)': 8}, {'Language': 'JavaScript', 'Users (in Millions)': 12}] df = pd.DataFrame(data) print(df)</p>	3 marks for correct and executable code.
31	<p>I. CREATE TABLE TEACHERS (TeacherID INT PRIMARY KEY, Name VARCHAR(25), Subject VARCHAR(20), Salary FLOAT);</p>	2 (I - Correct CREATE) + 1 (II - Correct INSERT)

	II. INSERT INTO TEACHERS VALUES (201, "Anita", "Maths", 45000);	
32	I. SELECT EmpName FROM Employee WHERE Department = 'IT' ORDER BY EmpName; II. SELECT e.EmpName, s.Amount FROM Employee e, Salary s WHERE e.EmpID = s.EmpID AND s.Amount > 60000; III. SELECT e.EmpName, e.Department, s.Amount FROM Employee e INNER JOIN Salary s ON e.EmpID = s.EmpID; OR I. ProductID can be the Primary Key. Justification: It uniquely identifies each product in the table and cannot have NULL values. II. ALTER TABLE PRODUCT ADD Stock INT; III. Output: Category AVG(Price) Electronics 40000.0000 Furniture 9500.0000 Stationery 35.0000	1 mark for each correct query/answer. OR 1 (I) + 1 (II) + 1 (III - Output)

Section-D (4 Marks each)

Q.No.	Answer	Marks Breakdown
33	I. (Statement-1): import matplotlib.pyplot II. (Statement-2): plt.plot(time, temp) III. (Statement-3): plt.title('City Temperature Throughout the Day') (or any suitable title) IV. (Statement-4): plt.savefig('temp.png')	1 mark for each correct blank.
34	I. SELECT UPPER(EmpName), UPPER(Department) FROM Employee ORDER BY Department; II. SELECT EmpID, YEAR(HireDate) AS HireYear FROM Employee; III. SELECT MAX(Salary) FROM Employee; IV. SELECT City, COUNT(*) AS NumberOfEmployees FROM Employee GROUP BY City; OR I. Output: Title LENGTH(Title) The Silent River 15 Data Science Essentials 21	1 mark for each correct query/output.

	<p>II. Output: lower(Genre) education</p> <p>III. Output: AVG(Price) 550.0000</p> <p>IV. Output: Title Author The Silent River R. Sharma World History P. Verma Inspiring Biographies A. Singh</p>	
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Section-E (5 Marks each)

Q.No.	Answer	Marks Breakdown
35	<p>I. The Administration department is the most suitable location for the server. Reason: It has the highest number of computers (115), indicating it is likely the central hub and would provide the most efficient access to the largest number of users within the Mumbai office.</p> <p>II. The most suitable cable layout is a Star Topology for the entire Mumbai office, with a switch in each department connected to a central switch (likely in Administration).</p> <p>III. Repeaters are not typically needed in a well-designed office LAN with switches, as cable lengths (max 135m) are well within the limits of standard Ethernet cables (100m for 100BASE-TX). If necessary, a repeater could be placed between Administration and Support if the cable run is just over 100m.</p> <p>IV. WAN (Wide Area Network), as it connects two offices in different cities over a large geographical distance (1550 km).</p> <p>V. A Switch should be used to connect all computers within each department. It intelligently forwards data only to the intended device, improving network efficiency.</p>	1 mark for each correct answer.
36	<p>I. print(df.head(2)) II. df['Grade'] = ['A', 'A+', 'B', 'A', 'A+'] III. df.drop(columns='Marks', inplace=True) OR del df['Marks'] IV. df.rename(columns={'StudentName': 'Name'}, inplace=True) V. print(df[['RollNo', 'Subject']])</p>	1 mark for each correct statement.
37	<p>I. SELECT LENGTH("Informatics"); II. SELECT SUBSTR(EmpName, 1, 4) FROM Employees; III. SELECT MAX(Salary) FROM Employee; IV. SELECT CURDATE(); OR SELECT SYSDATE(); V. SELECT COUNT(*) FROM Employee;</p>	1 mark for each correct query.

	<p>OR</p> <p>I. SELECT POWER(Marks, 2) FROM Student; II. SELECT COUNT(*) FROM Student WHERE Marks > 80; III. SELECT DISTINCT City FROM Student; IV. SELECT YEAR(Date_of_Birth) FROM Student; V. SELECT LOWER(Name) FROM Student;</p>	
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