

CLASS XII (SESSION 2023-2024)
PREBOARD EXAMINATION
INFORMATICS PRACTICES (065)

TIME: 03 HOURS

M.M.: 70

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A has 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 02 questions carrying 04 marks each.
7. Section E has 03 questions carrying 05 marks each.
8. All programming questions are to be answered using Python Language only.

SECTION A		
1.	Identify the type of network: ____ can be extended upto 30 to 40 km and is comprises of multiple small networks joined together. i. LAN ii. MAN iii. WAN iv. Wi-Fi	1
2.	When e-waste such as electronic circuit boards are burnt for disposal, the elements contained in them create a harmful chemical called _____ which causes skin diseases, allergies and an increased risk of lung cancer. i. Hydrogen ii. Beryllium iii. Chlorine iv. Oxygen	1
3.	Smridh needs to protect his personal information or data from unintentional and intentional attacks and disclosure which is termed as i. Digital right ii. Copyright iii. Privacy iv. Intellectual property	1
4.	Predict the output of the following query: SELECT ROUND (23.74 ,MOD (9 ,4)) ; i. 23.8 ii. 23.7 iii. 23.780 iv. 23.0	1

5.	<p>Which of the following SQL functions does not belong to the Date functions category?</p> <ul style="list-style-type: none"> i. YEAR() ii. LENGTH() iii. NOW() iv. SYSDATE() 	1
6.	<p>Smridh has recently changed his school so he is not aware of the people, but someone is posting negative, demeaning comments on his social media profile. He is also getting repeated mails from unknown people. Everytime he goes online, he finds someone chasing him online.</p> <p>Smridh is a victim of</p> <ul style="list-style-type: none"> i. Eavesdropping ii. Stolen identity iii. Phishing iv. Cyber stalking 	1
7.	<p>CSV stands for:</p> <ul style="list-style-type: none"> i. Column Separated Value ii. Class Separated Value iii. Comma Separated Value iv. Comma Segregated Value 	1
8.	<p>Raj, a Database Administrator, needs to display the average pay of workers from those departments which have more than five employees. He is experiencing a problem while running the query:</p> <p>Which of the following is a correct query to perform the given task?</p> <ul style="list-style-type: none"> i. <code>SELECT DEPT, AVG(SAL) FROM EMP WHERE COUNT(*) > 5 GROUP BY DEPT;</code> ii. <code>SELECT DEPT, AVG(SAL) FROM EMP HAVING COUNT(*) > 5 GROUP BY DEPT;</code> iii. <code>SELECT DEPT, AVG(SAL) FROM EMP GROUP BY DEPT WHERE COUNT(*) > 5;</code> iv. <code>SELECT DEPT, AVG(SAL) FROM EMP GROUP BY DEPT HAVING COUNT(*) > 5;</code> 	1
9.	<p>Predict the output of the following query:</p> <p><code>SELECT INSTR(MONTHNAME ('2023-03-05'), 'ay');</code></p> <ul style="list-style-type: none"> i. 2,2 ii. 0 iii. null iv. march 	1

10.	<p>Which of the following command will show the last 3 rows from a Pandas Series named NP?</p> <ul style="list-style-type: none"> i. NP.Tail() ii. NP.tail(3) iii. NP.TAIL(3) iv. All of the above 	1
11.	<p>With reference to SQL, identify the invalid data type.</p> <ul style="list-style-type: none"> i. Date ii. Integer iii. Varchar iv. Month 	1
12.	<p>In Python Pandas, while performing mathematical operations on series, index matching is implemented and all missing values are filled in with _____ by default.</p> <ul style="list-style-type: none"> i. Null ii. Blank iii. NaN iv. Zero 	1
13.	<p>By restricting the server and encrypting the data, a software company's server is unethically accessed in order to obtain sensitive information. The attacker blackmails the company to pay money for getting access to the data, and threatens to publish sensitive information unless price is paid. This kind of attack is known as:</p> <ul style="list-style-type: none"> i. Phishing ii. Identity Theft iii. Plagiarism iv. Ransomware 	1
14.	<p>In SQL, the equivalent of SUBSTR() is:</p> <ul style="list-style-type: none"> i. MID() ii. LEFT() iii. RIGHT() iv. CONCAT() 	1
15.	<p>_____ is a circuit board mounted on the motherboard to set the wired network connection.</p> <ul style="list-style-type: none"> i. Ethernet ii. IC iii. Router iv. Switch 	1

16.	<p>_____ is a non-profit organization that aims to build a publicly accessible global platform where a range of creative and academic work is shared freely.</p> <ol style="list-style-type: none"> i. Creative Cost ii. Critical Commons iii. Creative Commons iv. Creative Common 	1
17.	<p>Assertion (A):- A repeater is an analog device that works with signals on the cables to which it is connected.</p> <p>Reasoning (R): - The weakened signal appearing on the cable is regenerated and put back on the cable by a repeater.</p> <ol style="list-style-type: none"> 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 but R is False iv. A is false but R is True 	1
18.	<p>Assertion (A):- To use the Pandas library in a Python program, one must import it.</p> <p>Reasoning (R): - The only alias name that can be used with the Pandas library is pd.</p> <ol style="list-style-type: none"> 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 but R is False iv. A is false but R is True 	1
SECTION B		
19.	<p>Akriti thinks that router, switch and hub are the exactly similar devices. Do you think that a router is advanced than switch or hub in handling data packets? Help her by explaining it with the help of suitable example.</p>	2
20.	<p>The python code written below has syntactical errors. Rewrite the correct code and underline the corrections made.</p> <pre> Import pandas as pd df ={"Technology":["Programming", "Robotics", "3D Printing"], "Time(in months)": [4, 4, 3]} df= Pd.dataframe(df) Print(df) </pre>	2
21.	<p>Consider the given SQL string: “#You’ll do good!”</p> <p>Write suitable SQL queries for the following:</p> <ol style="list-style-type: none"> i. Returns the position of the first occurrence of the substring “do” in the given string. ii. To extract last five characters from the string. 	2

22.	<p>Predict the output of the given Python code:</p> <pre>import pandas as pd list1=[-10,-20,-30] ser = pd.Series(list1*2) print(ser)</pre>	2																																										
23.	Differentiate between copyright and patent.	2																																										
24.	<p>Complete the given Python code to get the required output as: Rajasthan</p> <pre>import _____ as pd di = {'Corbett': 'Uttarakhand', 'Sariska': 'Rajasthan', 'Kanha': 'Madhya Pradesh', 'Gir':'Gujarat'} NP = _____. Series(_____) print(NP[_____])</pre>	2																																										
25.	What are aggregate functions in SQL? Explain any two in brief.	2																																										
SECTION C																																												
26.	<p>Consider the following records in 'Cars' table and answer the given questions:</p> <table border="1"> <thead> <tr> <th>CarID</th> <th>Make</th> <th>Model</th> <th>Year</th> <th>Color</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>Toyota</td> <td>Camry</td> <td>2022</td> <td>Blue</td> <td>25000.00</td> </tr> <tr> <td>102</td> <td>Honda</td> <td>Civic</td> <td>2021</td> <td>Black</td> <td>22000.00</td> </tr> <tr> <td>103</td> <td>Ford</td> <td>Mustang</td> <td>2023</td> <td>Brown</td> <td>35000.00</td> </tr> <tr> <td>104</td> <td>Chevrolet</td> <td>Equinox</td> <td>2022</td> <td>White</td> <td>28000.00</td> </tr> <tr> <td>105</td> <td>BMW</td> <td>X5</td> <td>2023</td> <td>Blue</td> <td>45000.00</td> </tr> <tr> <td>106</td> <td>Volkswagen</td> <td>Golf</td> <td>2021</td> <td>Black</td> <td>20000.00</td> </tr> </tbody> </table> <p>a. Write SQL query that will give the output as:</p> <pre>Blu Bla Bro Blu</pre> <p>b. Write command for the following: To change the color of Model with code as 103 to 'Green'.</p> <p>c. How many tuples are present in the cars table? Also identify the most suitable column of the carstable to mark as primary key column.</p> <p style="text-align: center;">OR</p> <p>a. SELECT Make, Model FROM Cars WHERE Price > 30000.00; b. SELECT COUNT(*) AS 'TotalCars' FROM Cars WHERE Year = 2022; c. SELECT CarID, Make, Model FROM Cars where price<22000;</p>	CarID	Make	Model	Year	Color	Price	101	Toyota	Camry	2022	Blue	25000.00	102	Honda	Civic	2021	Black	22000.00	103	Ford	Mustang	2023	Brown	35000.00	104	Chevrolet	Equinox	2022	White	28000.00	105	BMW	X5	2023	Blue	45000.00	106	Volkswagen	Golf	2021	Black	20000.00	3
CarID	Make	Model	Year	Color	Price																																							
101	Toyota	Camry	2022	Blue	25000.00																																							
102	Honda	Civic	2021	Black	22000.00																																							
103	Ford	Mustang	2023	Brown	35000.00																																							
104	Chevrolet	Equinox	2022	White	28000.00																																							
105	BMW	X5	2023	Blue	45000.00																																							
106	Volkswagen	Golf	2021	Black	20000.00																																							

27.	<p>Create a DataFrame in Python from the given list: [[‘Divya’,’HR’,95000],[‘Mamta’,’Marketing’,97000],[‘Payal’,’IT’,980000], [‘Deepak’,’Sales’,79000]]</p> <p>Also give appropriate column headings as shown below:</p> <pre> Name Department Salary 0 Divya HR 95000 1 Mamta Marketing 97000 2 Payal IT 980000 3 Deepak Sales 79000 </pre> <p>i. Write python code to create the given DataFrame. ii. Add another row to the existing dataframe, values: (4, Raima, Sales, 58000) iii. Display the employee names drawing salary more than 89000.</p>	3									
28.	<p>Write MySQL statements for the following:</p> <p>i. To create a database named FOOD. ii. To create a table named Nutrients based on the following specification:</p> <table border="1"> <thead> <tr> <th>Column Name</th> <th>Data Type</th> <th>Constraints</th> </tr> </thead> <tbody> <tr> <td>Food_Item</td> <td>Varchar(20)</td> <td>Primary Key</td> </tr> <tr> <td>Calorie</td> <td>Integer</td> <td>Not Null</td> </tr> </tbody> </table> <p>iii. Change the datatype of column calorie to float.</p>	Column Name	Data Type	Constraints	Food_Item	Varchar(20)	Primary Key	Calorie	Integer	Not Null	3
Column Name	Data Type	Constraints									
Food_Item	Varchar(20)	Primary Key									
Calorie	Integer	Not Null									
29.	<p>Imagine a scenario where an individual, Aahan, is concerned about his online privacy. Aahan has a social media presence and frequently posts updates, photos, and comments on various platforms. Additionally, Aahan frequently uses mobile apps and visits websites for shopping and information.</p> <p>i. Explain the concept of an active digital footprint, providing examples from Aahan's online activities. ii. Describe the concept of a passive digital footprint and provide examples of how it is generated in Aahan's online interactions. iii. Discuss the implications of both active and passive digital footprints for Aahan's online privacy and security.</p> <p style="text-align: center;">OR</p> <p>With reference to 3R’s, describe three essential approaches to manage electronic waste. Also, provide practical examples of how individuals can actively participate in each approach.</p>	3									

30.	<p>Consider the given DataFrame 'Genre':</p> <table border="1"> <thead> <tr> <th></th> <th>Type</th> <th>Code</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Fiction</td> <td>F</td> </tr> <tr> <td>1</td> <td>Non Fiction</td> <td>NF</td> </tr> <tr> <td>2</td> <td>Drama</td> <td>D</td> </tr> <tr> <td>3</td> <td>Poetry</td> <td>P</td> </tr> </tbody> </table> <p>Write suitable Python statements for the following:</p> <ol style="list-style-type: none"> Add a column called Num_Copies with the following data: [300,290,450,760]. Add a new genre of type 'Folk Tale' having code as "FT" and 600 number of copies. Rename the column 'Code' to 'Book_Code'. 		Type	Code	0	Fiction	F	1	Non Fiction	NF	2	Drama	D	3	Poetry	P	3
	Type	Code															
0	Fiction	F															
1	Non Fiction	NF															
2	Drama	D															
3	Poetry	P															

SECTION D																																					
31.	<p>Preeti manages database in a blockchain start-up. For business purposes, she created a table named BLOCKCHAIN. Assist her by writing the following queries:</p> <p style="text-align: center;">TABLE: BLOCKCHAIN</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>id</th> <th>user</th> <th>value</th> <th>hash</th> <th>transaction_date</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Steve</td> <td>900</td> <td>ERTYU</td> <td>2020-09-19</td> </tr> <tr> <td>2</td> <td>Meesha</td> <td>145</td> <td>@345r</td> <td>2021-03-23</td> </tr> <tr> <td>3</td> <td>Nimisha</td> <td>567</td> <td>#wert5</td> <td>2020-05-06</td> </tr> <tr> <td>4</td> <td>Pihu</td> <td>678</td> <td>%rtyu</td> <td>2022-07-13</td> </tr> <tr> <td>5</td> <td>Kopal</td> <td>768</td> <td>rrt4%</td> <td>2021-05-15</td> </tr> <tr> <td>7</td> <td>Palakshi</td> <td>534</td> <td>wer@3</td> <td>2022-11-29</td> </tr> </tbody> </table> <ol style="list-style-type: none"> Write a query to display the year of oldest transaction. Write a query to display the month of most recent transaction. Write a query to display all the transactions done in the month of May. Write a query to count total number of transactions done in each year . 	id	user	value	hash	transaction_date	1	Steve	900	ERTYU	2020-09-19	2	Meesha	145	@345r	2021-03-23	3	Nimisha	567	#wert5	2020-05-06	4	Pihu	678	%rtyu	2022-07-13	5	Kopal	768	rrt4%	2021-05-15	7	Palakshi	534	wer@3	2022-11-29	4
id	user	value	hash	transaction_date																																	
1	Steve	900	ERTYU	2020-09-19																																	
2	Meesha	145	@345r	2021-03-23																																	
3	Nimisha	567	#wert5	2020-05-06																																	
4	Pihu	678	%rtyu	2022-07-13																																	
5	Kopal	768	rrt4%	2021-05-15																																	
7	Palakshi	534	wer@3	2022-11-29																																	
32.	<p>Consider the given DataFrame 'Employees':</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Employee_ID</th> <th>Department</th> </tr> </thead> <tbody> <tr> <td>Alice</td> <td>EMP001</td> <td>HR</td> </tr> <tr> <td>Bob</td> <td>EMP002</td> <td>Sales</td> </tr> <tr> <td>Carol</td> <td>EMP003</td> <td>IT</td> </tr> <tr> <td>David</td> <td>EMP004</td> <td>Marketing</td> </tr> </tbody> </table> <p>Write suitable Python statements for the following operations:</p> <ol style="list-style-type: none"> Add a column called 'Salary' with the following data: [55000, 60000, 65000, 58000]. Include a new employee named 'Eve' with Employee_ID 'EMP005', working in the 'Finance' department, and a salary of 62000. Change the name of the 'Employee_ID' column to 'ID'. Write a python code to display the number of elements in the dataframe and also the datatype of each column. 	Name	Employee_ID	Department	Alice	EMP001	HR	Bob	EMP002	Sales	Carol	EMP003	IT	David	EMP004	Marketing	4																				
Name	Employee_ID	Department																																			
Alice	EMP001	HR																																			
Bob	EMP002	Sales																																			
Carol	EMP003	IT																																			
David	EMP004	Marketing																																			

SECTION E

33

Observe the given tables carefully and attempt the following questions:

5

Table: BANK

ACC_NO	BRANCH_NAME	AMOUNT
B-70	Downtown	5000
B-230	Redwood	6000
B-260	Perryridge	3700

Table: CUSTOMER

CUSTOMER_NAME	ACC_NO
Jones	B-170
Smith	B-230
Hayes	B-155

- i. Identify the column based on which both the tables can be related or joined. Also justify your answer.
- ii. Write a SQL query to list names of all customers with their Amount in ascending order:
- iii. Write a SQL query to find the total amount of money across all branches.
- iv. Write a SQL query to count the total number of matching records in both the tables.
- v. Write a SQL query to display customer name along with the branch name.

A large educational campus with multiple departments and buildings is planning to establish an efficient network infrastructure to connect its various facilities. The campus comprises five main buildings, each with specific distance and computer requirements:

Distance between various buildings:

Building A to Building B: 50 meters

Building B to Building C: 30 meters

Building C to Building D: 30 meters

Building D to Building E: 35 meters

Building E to Building C: 40 meters

Building D to Building A: 120 meters

Building D to Building B: 145 meters

Building E to Building B: 65 meters

Each building hosts a varying number of computers:

Building A: 55 computers

Building B: 180 computers

Building C: 60 computers

Building D: 55 computers

Building E: 70 computers

Based on the above specifications, answer the following questions:

- (i) Suggest a possible cable layout for connecting the buildings in an efficient and effective way.
- (ii) Name the topology used for above cable layout.
- (iii) Suggest the most suitable place to install the server of this organisation.
- (iv) Suggest the placement of the following devices.
 - (a) Hub/Switch
 - (b) Repeater
- (v) The company wants to link its head office in 'A' building to its Office in Sydney. What type of network this connection result into?

35.

The heights of 10 students of eighth grade are given below:

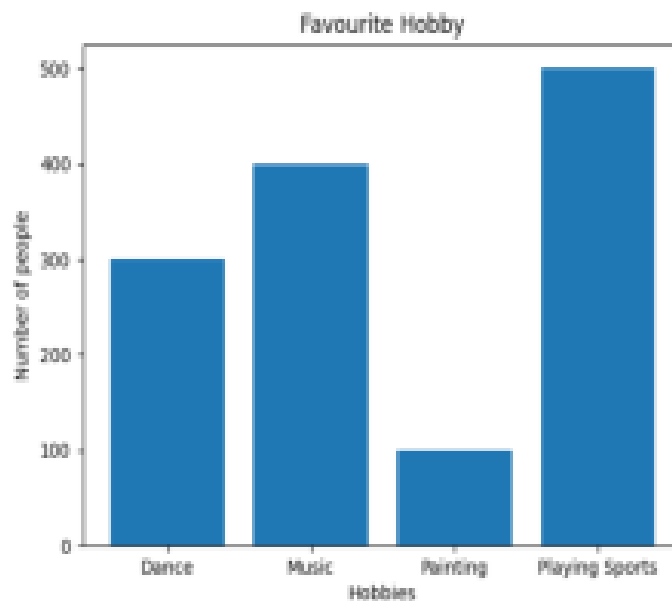
Height_cms=[145,141,142,142,143,144,141,140,143,144]

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

Also give suitable python statement to save this chart.

OR

Write suitable Python code to create '**Favourite Hobby**' Bar Chart as shown below:



Also give suitable python statement to save this chart.

5