

Registration No:

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**ALL KERALA COMMON MODEL EXAMINATION
INFORMATICS PRACTICES (065)
CLASS XII (2023 – 24)**

TIME : 3 Hours

MAX. MARKS: 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.	A circuit board mounted on the motherboard of a computer that acts as an interface between the computer and the network is called _____. i. Router ii. NIC iii. Gateway iv. Modem	[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 respiratory disorders and brain damage.	[1]

	<ul style="list-style-type: none"> i. Lead ii. Beryllium iii. Cadmium iv. Mercury 	
3.	<p>Technology not protected by copyright and available to everyone, is categorized as:</p> <ul style="list-style-type: none"> i. Shareware ii. Open Source iii. Proprietary iv. Experimental 	[1]
4.	<p>You are the sports leader of the 'ABC Public School'. On sports day, you have to calculate the average of the scores obtained by different games.</p> <p>You have been given the column 'Score' in the table 'SPORTS', which contains the scores of different games as (5, NULL, 2, 5).</p> <p>What will be the output when calculating the average of the scores obtained by different games?</p> <ul style="list-style-type: none"> i. 4 ii. 3 iii. 3.5 iv. 5 	[1]
5.	<p>Riya, a student in class XII, has downloaded a CSV file from the internet for her project. However, she does not want the previous data, which is in the first five rows of the file, for her data analysis. She wants to skip the previous data while importing the CSV file into the dataframe. Help her to skip the first 5 rows of the CSV file by choosing the right argument in read_csv().</p> <ul style="list-style-type: none"> i. skip_rows = 5 ii. noread - 5 iii. skiprows = 5 iv. skip - 5 	[1]
6.	<p>Which of the following SQL query is use to retrieve the string 'INDIA' from the text "&& INDIA &&" .</p> <ul style="list-style-type: none"> i. SELECT TRIM('&&') FROM '&& INDIA &&'; ii. SELECT TRIM('&&' FROM '&& INDIA &&'); iii. SELECT TRIM('&& INDIA &&' FROM '&&'); iv. SELECT TRIM('&&INDIA&&'); 	[1]
7.	<p>Firewalls are used to protect against _____.</p> <ul style="list-style-type: none"> i. virus attacks 	[1]

	<ul style="list-style-type: none"> ii. fire attacks iii. unauthorized access iv. data driven attacks 	
8.	<p>Ramandeep is a young woman with great aspirations and has a good team of like - minded people. She along with her team members started a company to sell handicrafts online and also designed a logo for their company. What type of intellectual property does this logo represent?</p> <ul style="list-style-type: none"> i. Patents ii. Trademark iii. Design iv. Copyright 	[1]
9.	<p>Predict the output of the following query:</p> <pre>SELECT INSTR('SEVEN POINT', 'e');</pre> <ul style="list-style-type: none"> i. 2 ii. 'E' iii. 1 iv. 0 	[1]
10.	<p>What will be the output of the following?</p> <pre>>>> import pandas as pd >>> seriesMnths = pd. Series([1,2,3,index=["Jan", "Feb", "Mar"]) >>> seriesMnths[1]</pre> <ul style="list-style-type: none"> i. Index Error ii. 2 iii. Feb iv. Jan 	[1]
11.	<p>Which of the following is not a text function in SQL?</p> <ul style="list-style-type: none"> i. length() ii. instring() iii. substr() iv. left() 	[1]
12.	<p>The first network is</p> <ul style="list-style-type: none"> i. Internet ii. NSFnet iii. NET iv. ARPANET 	[1]
13.	<p>What is the significance of the statement "HAVING COUNT (emp_id)>2" in</p>	[1]

	<p>the following MySQL statement?</p> <pre>SELECT name, COUNT (emp_id),emp_no FROM department GROUP BY name HAVING COUNT (emp_id)>2;</pre> <ol style="list-style-type: none"> Selecting those rows whose total emp_id>2 Both filter out all rows whose total emp_id below 2 and selecting those rows whose total emp_id>2 Filter out all rows whose total emp_id below 2 None of these 	
14.	<p>Rahul wants to disable cookies in his browser. Under which of the following browser settings options/panels can Rahul disable the cookies?</p> <ol style="list-style-type: none"> Home Panel Search Panel Privacy and Security Panel General Panel 	[1]
15.	<p>The manufacturer of any electronic equipment will be “personally” responsible for the final safe disposal of the product when it becomes an e-waste.</p> <p>The above guidelines for proper handling and disposal of e-waste have been issued by whom?</p> <ol style="list-style-type: none"> Information Technology Act Department of Information Technology Central Pollution Control Board The Environment Protection Act 	[1]
16.	<p>Out of the following, which function cannot be used for customization of charts in Python?</p> <ol style="list-style-type: none"> xlabel() color() title() xticks() 	[1]
17.	<p>Assertion (A): Pandas.head() is an attribute of the Python data structure.</p> <p>Reason (R): It is used to display the first/top 5 records of any series/dataframe.</p> <ol style="list-style-type: none"> Both A and R are true and R is the correct explanation of A. Both A and R are true but R is not the correct explanation of A. A is true but R is false. A is false but R is true. 	[1]
18.	<p>Assertion (A): Privacy of sensitive data can be implemented by encryption.</p>	[1]

	<p>Reason(R): Encryption hides (Encodes) the details of the Actual data.</p> <ul style="list-style-type: none"> i. Both A and R are true and R is the correct explanation of A. ii. Both A and R are true but R is not the correct explanation of A. iii. A is true but R is false. iv. A is false but R is true. 	
SECTION B		
19.	<p>Mention any four differences between Internet & WWW.</p> <p>OR</p> <p>Lia is doing a course in Web Technologies. As a part of her project, she needs to extend and modify the functionality of her web browser. She has opted to use add-ons or plug-ins to boost the performance of the browser. However, she doesn't know the difference between these tools. Help her understand the difference between add-ons and plug-ins with an example.</p>	[2]
20.	<p>Consider the given dataframe 'num':</p> <pre> C1 C2 C3 1 8 20 1 2 4 5 25 3 10 19 7 4 15 12 3 </pre> <p>Fill in the blanks to get the given output:</p> <p>a.</p> <pre> C1 C2 1 8 20 3 10 19 </pre> <p>print(num.loc[_____ , _____])</p> <p>b.</p> <pre> 3 7 4 3 Name: C3, dtype: int64 </pre> <p>print(num.iloc[_____ , _____])</p>	[2]
21.	<p>Consider the following table BOOK.</p>	[2]

Code	Title	Author	Publication	Price
D001	Physics	Vikas Sharma	xxx	250
D002	Chemistry	Preeti Goyal	yyy	300
D003	Computer Science	Swati Rana	zzz	275
D004	English	Sanjeev Jain	aaa	150
D005	Mathematics	Rajiv Rastogi	bbb	400

Give the output of the following SQL commands on the basis of the above table BOOK.

SELECT LEFT (Publication, 1) FROM BOOK WHERE Price > 280;

22. Ruhi has just designed a website for her boutique 'Grace' in HTML language and now she needs a web address for the page. Briefly discuss about URL and its components to uniquely identify web resources with a suitable example. **[2]**

23. Complete the given Python code to get the required output as "Italy" from the given dataframe 'populations': **[2]**

```

Country  Population  Percent
1  Italy          61         0.83
2  Spain          46         0.63
3  Greece         11         0.15

import pandas as ps

pop = [ ['Italy',61,0.83],[ 'Spain',46,0.63],[ 'Greece',11,0.15] ]

populations = _____(pop, _____ = [ 'Country', 'Population' ,
'Percent'],
_____ = [ 1,2,3])

print(populations.loc[ _____])

```

24. Kaushal writes the following commands with respect to a table student having fields name, rollno, marks and records of 5 students. **[2]**

Command1 : select count(marks) from student;

Command2 : select count(*) from student;

He gets the output as 4 for the Command1 and 5 for Command2. Explain the output with justification.

25. Kavyanjali, a chemical analyst, needs to arrange data of few elements in the form of two series containing symbols and their atomic numbers **[2]**

respectively. Thereafter, the data of these two series has to be arranged and displayed in the form of Data Frame as shown below:

	Symbol	Atomic Number
Hydrogen	H	1
Helium	He	2
Lithium	Li	3
Beryllium	Be	4

SECTION C

26.	<p>Consider the following records in 'STUDENT' table and answer the given questions:</p> <table border="1" data-bbox="256 293 1321 792"> <thead> <tr> <th>Admno</th> <th>Name</th> <th>Class</th> <th>DOB</th> <th>House</th> <th>Gender</th> </tr> </thead> <tbody> <tr> <td>20150001</td> <td>Dimple Varma</td> <td>10</td> <td>2002-07-29</td> <td>Green</td> <td>Female</td> </tr> <tr> <td>20140212</td> <td>Mohit Bhardwaj</td> <td>11</td> <td>2003-12-01</td> <td>Red</td> <td>Male</td> </tr> <tr> <td>20130216</td> <td>Mukesh Sharma</td> <td>9</td> <td>2001-01-29</td> <td>Red</td> <td>Male</td> </tr> <tr> <td>20190227</td> <td>Rahul Arora</td> <td>10</td> <td>NULL</td> <td>Blue</td> <td>Male</td> </tr> <tr> <td>20120200</td> <td>Swapnil Bhatt</td> <td>11</td> <td>2003-07-05</td> <td>Red</td> <td>Female</td> </tr> </tbody> </table> <p>i. Write SQL query that will give the output as:</p> <p style="text-align: center;">4</p> <p>ii. Write command for the following: To change the class of Mukesh Sharma with admission number 20130216 to 10.</p> <p>iii. What is the cardinality of the table 'STUDENT'? Also identify the most suitable column of the STUDENT table to make as primary key.</p> <p>OR</p> <p>Predict the output of the following queries based on the table 'STUDENT' given above:</p> <p>i. <code>SELECT MID(Name,LENGTH(House)-1,2) FROM STUDENT;</code></p> <p>ii. <code>SELECT DAY(DOB) FROM STUDENT WHERE Class > 10;</code></p> <p>iii. <code>SELECT INSTR(House, RIGHT(Gender,1)) AS 'INSTRING' from STUDENT;</code></p>	Admno	Name	Class	DOB	House	Gender	20150001	Dimple Varma	10	2002-07-29	Green	Female	20140212	Mohit Bhardwaj	11	2003-12-01	Red	Male	20130216	Mukesh Sharma	9	2001-01-29	Red	Male	20190227	Rahul Arora	10	NULL	Blue	Male	20120200	Swapnil Bhatt	11	2003-07-05	Red	Female	[3]
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27.	<p>Write python code to create a Dictionary 'dict' to store rollno, name and marks of three students. Convert dict into DataFrame df and display the DataFrame df.</p>	[3]																																				

28.	<p>In the database 'Hospital', create a table named 'patient' based on the following specifications:</p> <table border="1" data-bbox="255 313 1321 542"> <thead> <tr> <th>Column Name</th> <th>Data Type</th> <th>Constraints</th> </tr> </thead> <tbody> <tr> <td>PID</td> <td>Varchar</td> <td>Primary Key</td> </tr> <tr> <td>PName</td> <td>Varchar</td> <td></td> </tr> <tr> <td>Gender</td> <td>Char</td> <td>Not Null</td> </tr> </tbody> </table> <p>Also write SQL statement for the following:</p> <ol style="list-style-type: none"> Add a new column Rec_ID of integer data type. Change the constraint from not null to null in the column Gender. 	Column Name	Data Type	Constraints	PID	Varchar	Primary Key	PName	Varchar		Gender	Char	Not Null	[3]
Column Name	Data Type	Constraints												
PID	Varchar	Primary Key												
PName	Varchar													
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29.	<p>Riti received a message that she needs to update the KYC for her Bank Account; therefore, she should upload her Aadhar Card, Bank Account Number, and OTP to the link given in her message. Answer the following questions:</p> <ol style="list-style-type: none"> Should Riti upload the documents and give the OTP on the link? What is the act mentioned in the message known as? Under which act can she lodge a complaint with the relevant authorities? Suggest her any two precautionary measures that she should take in the future while being online to avoid any such situations. <p>OR</p> <p>Kartik is fond of playing computer games. What are the different health hazards that can occur due to excessive use of computer or smart phone screens, and how can the health hazards be addressed?</p>	[3]												
30.	<p>Consider the given DataFrames 'Stock'</p> <pre data-bbox="255 1444 638 1668"> PID PName Qty 0 1 pen 2 1 2 pencil 10 2 3 eraser 10 3 4 color 30 4 5 sharpener 10 </pre> <p>Write suitable Python statements for the following:</p> <ol style="list-style-type: none"> Add a column called "Price" with the following data: [300,20,50,40,15] Add a new product "ruler" with a product ID as 6, 5 number of quantities, and a price of Rs 8. Rename the column "Price" as "UnitPrice". 	[3]												

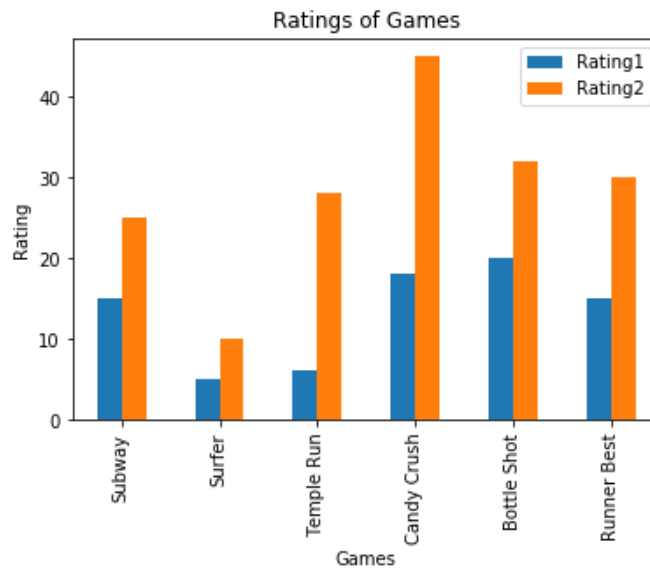
SECTION D

31. Imagine you are assigned to be the HR manager of a multinational company. The company uses an SQL database to track employee details in a table named 'EMP'. The 'EMP' table has columns for 'EID' (Primary Key), 'ENAME', 'DOJ'(Date of Joining), 'Salary', and 'Dept'. **[4]**

The following scenarios represent different human resource management tasks:

- i. Salary Increment: After the revised pay scale, the 'Salary' of employees, with 'EID' "E115" and "E332" named "Anurag" and "Prabhaker" respectively, should be increased by 5%.
- ii. Number of Employees: You need to get the total number of employees in each department.
- iii. Employee Availability Check: You need to check the availability of employees who joined before November 17, 2016 in the 'ADMIN' department.
- iv. Average Salary: You need to display the average salary for those departments that have more than 15 employees.

32. Mr. Sharma, a game developer, has plotted a chart to estimate the distribution of two different ratings of the various games available in the Play Store, as shown below:



He is trying to write the following statements to plot the graph. Help Mr. Sharma to fill up the blanks with Python code to get the desired output.

```
import pandas as pd  
  
_____ # statement 1
```

	<p>df = _____(# statement 2</p> <pre>{'Games':['Subway','Surfer','Temple Run','Candy Crush','Bottle Shot','Runner Best'], 'Rating1':[15,5,6,18,20,15], 'Rating2':[25,10,28,45,32,30] }</pre> <p>_____ (kind = 'bar', x = 'Games', y = _____) # statement 3 & 4</p> <pre>mat.xlabel('Games') mat.ylabel('Rating') mat.title('Ratings of Games') mat.show()</pre> <ol style="list-style-type: none"> Choose the correct Python statement to import the library to plot the bar graph in statement 1. Choose the correct Python statement to create the dataframe in statement 2. Choose the correct Python statements in statements 3 and 4, respectively, to plot a bar graph from the dataframe created. <p style="text-align: center;">OR (Option for part iii only)</p> <p>Write the Python statement to export the dataframe created to the CSV file named "DATA", which is in the "D" drive.</p>																
SECTION E																	
33.	<p>Write suitable SQL queries for the following:</p> <ol style="list-style-type: none"> To calculate the exponent for 5 raised to the power of 6. To retrieve the current year. To round off the value 8659.8953 to the nearest hundred. To display the position of '-' from the string "Israel-Hamas Conflicts". To convert the text in the 'Item_Name' column of the 'ITEM' table to uppercase. <p>OR</p> <p>Observe the given tables carefully and attempt the following questions:</p> <p>Table : Student</p> <table border="1" data-bbox="256 1861 1310 2027"> <thead> <tr> <th>Roll No</th> <th>Name</th> <th>Class</th> <th>Section</th> <th>Registration_ID</th> </tr> </thead> <tbody> <tr> <td>11</td> <td>Mohan</td> <td>XI</td> <td>1</td> <td>IP-101-15</td> </tr> <tr> <td>12</td> <td>John</td> <td>XI</td> <td>2</td> <td>IP-104-15</td> </tr> </tbody> </table>	Roll No	Name	Class	Section	Registration_ID	11	Mohan	XI	1	IP-101-15	12	John	XI	2	IP-104-15	[5]
Roll No	Name	Class	Section	Registration_ID													
11	Mohan	XI	1	IP-101-15													
12	John	XI	2	IP-104-15													

21	Sohan	XII	1	CS-103-14
22	Meena	XII	2	CS-101-14
23	Juhi	XII	2	CS-102-10

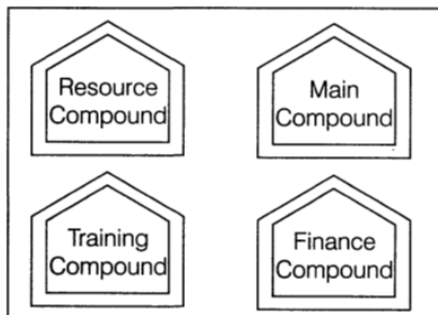
Table: Project

Registration_ID	ProjectNo
IP-101-15	101
IP-104-15	103
CS-103-14	102
CS-101-14	105
CS-102-10	104

- i. Identify the column based on which both tables can be related or joined. Also, justify your answer.
- ii. Write the SQL query to list the names of the students with their project numbers in descending order.
- iii. Write the SQL query to find the total number of students in each class.
- iv. Write the SQL query to retrieve six characters extracted from the fourth left character onwards from the 'Registration_ID' of the "Student" table.
- v. Write the SQL query to remove the leading and trailing spaces from the names of the students.

34. Learn Together is an educational NGO. It is setting up its new campus at Jabalpur for its web - based activities. The campus has four compounds as shown in the diagram below:

[5]



Centre to centre distance between various compounds as per architectural drawing (in meters) is as follows:

Main Compound to Resource Compound	110 m
Main Compound to Training Compound	115 m
Main Compound to Finance Compound	35 m
Resource Compound to Training Compound	25 m
Resource Compound to Finance Compound	135 m
Training Compound to Finance Compound	100 m

Expected number of computers in each compound are as follows:

Main Compound	5
Resource Compound	15
Training Compound	150
Finance Compound	20

- i. Suggest a cable layout of connections between the compounds.
- ii. Suggest the most suitable place (i.e. compound) to house the server for this NGO. Also, provide a suitable reason for your suggestion.
- iii. Suggest the placement of the following devices with justification:
 - a. Repeater
 - b. Hub/Switch
- iv. The NGO is planning to connect its international office situated in Mumbai, which out of the following wired communication link, will you suggest for a very high-speed connectivity?
 - a. Optical Fibre
 - b. Telephone analog line
 - c. Ethernet cable
 - d. None of these
- v. Which protocol or service will be most helpful to conduct live interactions between experts from Mumbai office and people at the Jabalpur campus?

35. The table below shows the marks of two students for the four-unit tests for academic session 2022-2023. Plot a line graph for each student with test names on the X axis, marks on the Y axis, and a legend in the upper right

[5]

of the chart. Also, save the figure obtained.

Tests	Marks	
	Rohit	Suman
Unit1	85	97
Unit2	88	99
Unit3	89	90
Unit4	87	92

OR

You are provided with the following data on the number of students who participated in a programming competition over the years:

Year	Participants
2018	150
2019	180
2020	210
2021	250

Create a bar graph to visualize the growth of participants over the years. Give appropriate labels and also save the figure obtained.