ST. BENEDICT'S SCHOOL, SHIVPURI

Half Yearly Examination (2025-26)

SUBJECT: INFORMATICS PRACTICES (065)

CLASS: XII

Max Time: 3 hrs. **Max Marks: 70**

General Instructions:

- Please check this question paper contains 37 questions.
- All questions are compulsory. However, internal choices have been provided in some question.

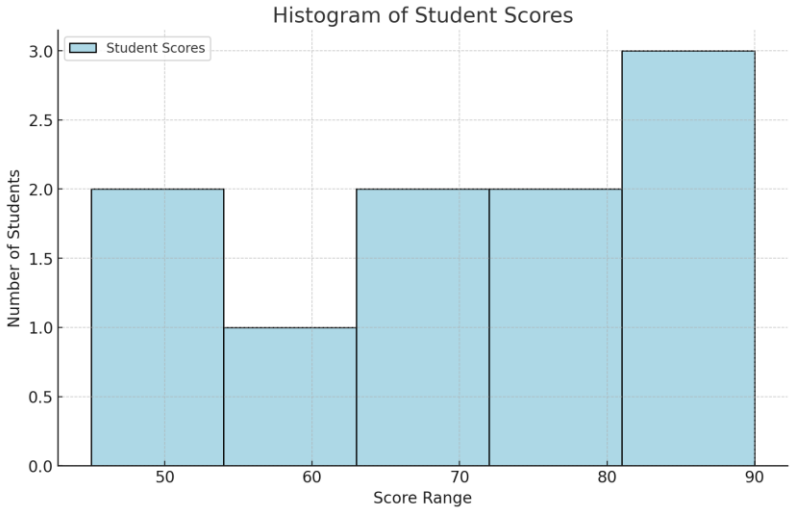
  Attempt only one of the choices in such questions
- The paper is divided into 5 Sections- A, B, C, D and E.
- Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
- Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
- Section C consists of 4 questions (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.

SECTION A (21X1=21 marks) Select the most appropriate option out of the four choices given for each of the question		
Q.No	**Question**	**Marks**
1	State True or False "The default index of a Pandas DataFrame is numeric starting from 1"	1
2	Which method is used to read a CSV file in Pandas? a) pd.read_excel() b) pd.read_csv() c) pd.load_csv() d) pd.open_csv()	1
3	What does the fillna() function in Pandas do? a) Deletes missing values b) Fills missing values with a specified value c) Sorts the DataFrame	1

	d) Filters the DataFrame	
4	Which plot is used to show distribution of data? a) Line plot b) Histogram c) Pie chart d) Bar chart	1
5	Which of the following is the correct syntax for extracting the first 3 characters from the Name column? a) LEFT(Name, 3) b) SUBSTRING(Name, 3) c) RIGHT(Name, 3) d) NAME(3)	1
6	What will be the output of **MID('INFORMATICS', 3, 4)**? a) FOR b) FORM c) ORMA d) NFOR	1
7	What will MONTH('2025-07-28') return? a) 07 b) **7** c) July d) 28	1
8	Which of the following queries returns a list of unique cities from a Customers table? a) SELECT ALL City FROM Customers; b) SELECT UNIQUE City FROM Customers; c) SELECT DISTINCT City FROM Customers; d) SELECT City FROM Customers WHERE DISTINCT;	1
9	What will DAYNAME('2025-07-28') return? a) 28 b) Monday c) Tuesday d) July	1
10	In pandas, what does the iterrows() function do? a) Iterates over the columns of a DataFrame b) Iterates over each row as index and Series pair c) Iterates over rows as a list of lists d) Iterates over DataFrame in reverse order	1
11	Consider the data frame df: **Name** **Subject** **Marks** Aman Math 85 Riya English 92 Kabir Science 78 Simran Math 88 Tara English 90 Write a Python statement to display all rows except the last 3 rows**.**	1

12	Which pattern would match names that end with the letter 'n'? a) 'n%' b) '%n' c) '_n' d) '%n%'	1
13	What is the correct way to filter out rows where the value is not NULL? a) WHERE Marks != NULL b) WHERE Marks <> NULL c) WHERE Marks IS NOT NULL d) WHERE NOT NULL	1
14	Which of the following statements is true about the BETWEEN operator? a) It is exclusive of the boundary values b) It can only be used with numeric data c) It is inclusive of the boundary values d) It cannot be used with dates	1
15	Which of the following is the correct syntax to use a database named School? a) CHOOSE School; b) USE DATABASE School; c) USE School; d) SELECT School;	1
16	What type of data would the SQL DECIMAL(5,2) hold? a) Exactly 5 digits b) 5 digits in total, with 2 after the decimal point c) 5 digits after the decimal point d) Any number with 2 digits before the decimal point	1
17	Which of the following keys can accept NULL values? a) Primary Key b) Candidate Key c) Foreign Key d) Super Key	1
18	A table EMPLOYEES has 50 rows and 6 columns. What is the cardinality of the table? a) 6 b) 50 c) 56 d) 300	1
19	Which of the following SQL functions returns the number of rows in a column (excluding NULL values)? a) SUM() b) AVG() c) COUNT(column_name) d) MAX()	1
Question nos 20 to 21 are Assertion-reason Questions: there are two statements- Assertion (A) and reason (R) in each question. Answer these questions by selecting the most suitable options given below:		

a) Both A and R are true and R is the correct explanation of A b) Both A and R are true and R is not the correct explanation of A c) A is true but R is false d) A is false but R is true		
20	**Assertion (A):** The plt.title() function is used to give a title to a chart in Matplotlib. **Reason (R):** plt.title() sets the title at the bottom of the chart by default.	1
21	**Assertion (A):** plt.bar() is used to create bar charts in Matplotlib. **Reason (R):** Bar charts are suitable for showing the relationship between continuous data.	1
SECTION B (7X2=14 marks)		
22	Write a Python program to create a Pandas Series named marks with the following values and display only those marks which are greater than or equal to 80. [78, 85, 92, 67, 88, 73] **OR** Consider the following code written by Pooja. Her code is throwing errors. Rewrite the correct code and underline the corrections made. import panda as pd data = ['Name': ['Riya', 'Amit'], 'Marks': [87, 90]] df = pd.Dataframe(data) print df	2
23	Given the following two Pandas Series s1 and s2. import pandas as pd s1 = pd.Series([10, 20, 30, 40], index=['a', 'b', 'c', 'd']) s2 = pd.Series([2, 4, 5, 10], index=['b', 'c', 'd', 'e']) Write the Python code to perform the following operations and write the output: a) Multiply the two Series (s1 * s2) b) Divide the two Series (s1 / s2)	2
24	Write a Pandas code snippet to load a CSV file named data.csv and display the last 3 rows.	2
25	What will be the output of the following Query? a) SELECT SUBSTRING(TRIM(' Informatics '), 1, 5) b) SELECT YEAR('2025-07-28')	2
26	The following SQL query is written to fetch the names and levels of players who scored more than or equal to 300 and play "Sudoku". SELECT Name Level FROM Players WHERE score => '300' AND Game = Sudoku; But query is not producing the correct output, correct the above query so that to gets the desired output.	2

<table>
<tr><td>27</td><td>Differentiate between DDL and DML commands in SQL. Give two examples of each.</td><td>2</td></tr>
<tr><td>28</td><td>You are given a table named PLAYER with the following columns:
• PlayerID (INT)
• Name (VARCHAR)
• Game (VARCHAR)
• Score (INT)
Write an SQL query to:
a) Add a new column Level of type INT to the table.
b) Modify the Name column to increase its size to VARCHAR(50)</td><td>2</td></tr>
<tr><td colspan="3">SECTION C (4X3=12 marks)</td></tr>
<tr><td>29</td><td>Write a code to create the following histogram with proper labels, title, and a legend ("Student Scores") with the given values of x.
x = [45, 78, 56, 89, 90, 66, 72, 53, 81, 69] and bins=5
 

Note: Bin color is light blue and edge color is black</td><td>3</td></tr>
<tr><td>30</td><td>Answer the following questions based on the table Employee given below
Table: Employee
<table>
<tr><th>EmpID</th><th>Name</th><th>Department</th><th>Salary</th><th>JoinDate</th><th>Gender</th></tr>
<tr><td>101</td><td>Riya</td><td>HR</td><td>55000</td><td>2021-06-12</td><td>F</td></tr>
<tr><td>102</td><td>Kabir</td><td>Finance</td><td>62000</td><td>2020-03-18</td><td>M</td></tr>
<tr><td>103</td><td>Anya</td><td>IT</td><td>75000</td><td>2019-11-01</td><td>F</td></tr>
<tr><td>104</td><td>Samar</td><td>Marketing</td><td>58000</td><td>2022-01-25</td><td>M</td></tr>
</table>
a) Write the SQL query to create the above table.
b) Suggest a suitable primary key for the table</td><td>3</td></tr>
</table>

c) Find the degree of the table

OR

a) Write an SQL query to update the salary of employee with EmpID102 to 65000.
b) Write an SQL query to insert a new employee record into the table with values (105, 'Meera', 'IT', 72000, '2023-02-15', 'F')
c) Write an SQL query to display the records sorted by Salary in descending order

31 (3)

Consider the following DataFrame GameStats

Index	Player	Game	Score	Level
0	Arjun	Chess	250	3
1	Simran	Sudoku	300	4
2	Kabir	Ludo	180	2
3	Neha	Carrom	270	3
4	Rohan	Chess	350	5

Write suitable Python statements to perform the following tasks:

a) Write Python code to create the above Data Frame
b) Change the row labels to ['P1', 'P2', 'P3', 'P4', 'P5']
c) Add a new row for player 'Tanya' who plays 'Sudoku' with score 320 and level 4

OR

a) Rename column 'Score' to 'Game_Score'
b) Display only those rows where the game is 'Chess'
c) What is the shape and dimension of the DataFrame?

32 (3)

Consider the table EMPLOYEE

EmpID	Name	Department	Salary	DOJ
201	Ramesh	HR	45000	2020-06-12
202	Seema	IT	55000	2021-09-23
203	Arjun	IT	48000	2020-03-11
204	Neha	Accounts	52000	2022-01-05
205	Karan	HR	47000	2019-12-15

a) Display names and DOJ of employees who joined after 1st Jan 2021.
b) Find the total salary of all employees in the IT department.

c) Display employees in descending order of Salary.

OR

a) Display names of employees who joined before 1st January 2021.
b) Find the total salary of employees in the HR department.
c) Display the second highest salary in the EMPLOYEE table.

SECTION D (2X4=8 marks)

33 Consider the following DataFrame df: 4

Index	Name	Marks	Grade
0	Amit	85	B
1	Bina	90	A
2	Chetan	78	C
3	Divya	88	B
4	Esha	92	A

Answer the following questions:

a) Write the output of df.loc[1:3, ['Name', 'Grade']]
b) Write a statement to access the value at 2nd row and 1st column using iloc.
c) What will be the output of df.shape and df.ndim?
d) What does df.size return?

OR

a) Write a statement to access the Marks of Bina using the at[] function.
b) Write a Python statement to add a new column City with the following values:
['Delhi', 'Mumbai', 'Chennai']
c) Write a Python statement to rename the column Marks to Score. Ensure the change is permanent in the DataFrame.
d) Write the Python statement to export this DataFrame df to a CSV file named students.csv and store it in the D: drive.

34 Kumar a Data Base Administrator has designed the MYSQL table that contains the details of 4 student's data as shown below. Help him in writing SQL queries to perform the following task for the queries (a) to (d) based on the table STUDENT given below: 4

RollNo	Name	Marks	Grade
101	Riya	89.75	B
102	Kabir	77.38	C
103	Anya	91.60	A

104	Samar	84.20	B

a) Write an SQL query to display the Marks of the student with RollNo 102, rounded up to one decimal place.
b) Write an SQL query to display the result of 2 raised to the power 3, only if the student's name is Riya.
c) Write an SQL query to find the remainder when the Roll number of Samar is divided by 2.
d) Write an SQL query to display the name of the student with RollNo 103 in uppercase letters.

SECTION E (3X5=15 marks)

35 — 5

Consider the following two tables:

Table: EMPLOYEE

EmpID	Name	Department	Salary
201	Ramesh	HR	45000
202	Seema	IT	55000
203	Arjun	IT	48000
204	Neha	Accounts	52000
205	Karan	HR	47000

Table: DEPARTMENT

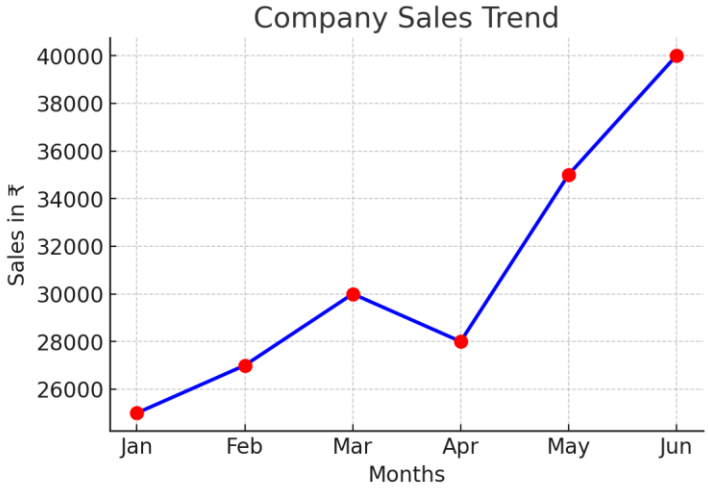
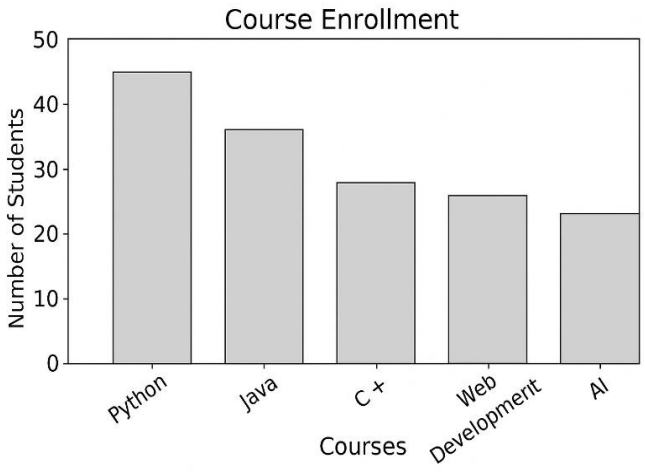
DeptID	Department	Location
D1	HR	Delhi
D2	IT	Mumbai
D3	Accounts	Kolkata

Write SQL queries for the following:

a) Display the total salary paid to each department.
b) Display only those departments whose total salary is more than 90000.
c) Display department-wise average salary in ascending order of average salary.
d) Display the Name, Department, and Location of employees using an equi-join between EMPLOYEE and DEPARTMENT tables.
e) Display department-wise count of employees using GROUP BY.

OR

a) Display the highest salary in each department along with the department name.
b) Display department names and the number of employees working in

	each department, but only for those departments having more than 1 employee. c) Display the names of employees working in Mumbai along with their salary (using an equi-join). d) Display department names and their total salary in descending order of total salary. e) Display employee names, their department, and location, but only for employees whose salary is greater than 50000 (using equi-join).	
36	Write a Python program to plot a line chart showing the sales of a company for 6 months. Also give suitable python statement to save this chart.  Note: Marker colour is red , marker edge colour is black and line colour is blue	5
37	Write a Python program to plot a bar chart showing the number **of** students enrolled in different courses**.** Also give suitable python statement to save this Chart. 	5