CBSE SAMPLE QUESTION PAPER (SOLVED)
CLASS XII
INFORMATICS PRACTICES (065)

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

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 1 mark each.

4. Section B has 7 Very Short Answer type questions carrying 2 marks each.

5. Section C has 5 Short Answer type questions carrying 3 marks each.

6. Section D has 3 Long Answer type questions carrying 5 marks each.

7. Section E has 2 questions carrying 4 marks each. One internal choice is given in both Q.34 and Q.35.

8. All programming questions are to be answered using Python Language only.

Section A

1. Television cable network is an example of: (1)
    (i) LAN   (ii) WAN
    (iii) MAN   (iv) Internet

Ans. (iii) MAN

2. Which of the following is not a type of cybercrime?   (1)
    (i) Data theft   (ii) Installing antivirus for protection
    (iii) Forgery   (iv) Cyberbullying

Ans. (ii) Installing antivirus for protection

3. What is an example of e-waste?   (1)
    (i) A ripened mango   (ii) Unused old shoes
    (iii) Unused old computers   (iv) Empty cola cans

Ans. (iii) Unused old computers

4. Which type of values will not be considered by SQL while executing the following statement?   (1)
    `SELECT COUNT(column name) FROM inventory;`
    (i) Numeric value   (ii) Text value
    (iii) Null value   (iv) Date value

Ans. (iii) Null value

5. If column "`Fees`" contains the data set (5000, 8000, 7500, 5000, 8000), what will be the output after the execution of the given query?   (1)
    `SELECT SUM (DISTINCT Fees) FROM student;`
    (i) 20500   (ii) 10000
    (iii) 20000   (iv) 33500

Ans. (i) 20500

6. 'O' in FOSS stands for: (1)
    (i) Outsource   (ii) Open
    (iii) Original   (iv) Outstanding

Ans. (ii) Open

7. Which SQL statement do we use to find out the total number of records present in the table ORDERS? (1)
    (i) `SELECT * FROM ORDERS;`   (ii) `SELECT COUNT(*)FROM ORDERS;`
    (iii) `SELECT FIND(*)FROM ORDERS;`   (iv) `SELECT SUM()FROM ORDERS;`

Ans. (ii) `SELECT COUNT(*)FROM ORDERS;`

8. Which one of the following is not an aggregate function? (1)
   (i) `ROUND()` (ii) `SUM()`
   (iii) `COUNT()` (iv) `AVG()`
Ans. (i) `ROUND()`

9. Which one of the following functions is used to find the largest value from the given data in MySQL? (1)
   (i) `MAX()` (ii) `MAXIMUM()`
   (iii) `BIG()` (iv) `LARGE()`
Ans. (i) `MAX()`

10. To display last five rows of a series object '`S`', you may write: (1)
    (i) `S.Head()` (ii) `S.Tail(5)`
    (iii) `S.Head(5)` (iv) `S.tail()`
Ans. (iv) `S.tail()`

11. Which of the following statement will import pandas library? (1)
    (i) `Import pandas as pd` (ii) `import Pandas as py`
    (iii) `import pandas as pd` (iv) `import panda as pd`
Ans. (iii) `import pandas as pd`

12. Which of the following can be used to specify the data while creating a DataFrame? (1)
    (i) Series (ii) List of Dictionaries
    (iii) Structured ndarray (iv) All of these
Ans. (iv) All of these

13. Which amongst the following is not an example of a browser? (1)
    (i) Chrome (ii) Firefox
    (iii) Avast (iv) Edge
Ans. (iii) Avast

14. In SQL, which function is used to display current date and time? (1)
    (i) `Date()` (ii) `Time()`
    (iii) `Current()` (iv) `Now()`
Ans. (iv) `Now()`

15. Legal term to describe the rights of a creator of original creative or artistic work is: (1)
    (i) Copyright (ii) Copyleft
    (iii) GPL (iv) FOSS
Ans. (i) Copyright

16. _____ is the trail of data we leave behind when we visit any website (or use any online application or portal) to fill-in data or perform any transaction. (1)
    (i) Offline phishing (ii) Offline footprint
    (iii) Digital footprint (iv) Digital phishing
Ans. (iii) Digital footprint

Q.17 and 18 are Assertion and Reason-based questions. Mark the correct choice:
(a) Both A and R are true and R is the correct explanation for A
(b) Both A and R are true and R is not the correct explanation for A
(c) A is True but R is False
(d) A is false but R is True

17. **Assertion (A):** Internet cookies are text files that contain small pieces of data, like a username, password and user's preferences while surfing the internet.
    Reason (R): To make browsing the Internet faster and easier, it is required to store certain information on the server's computer. (1)
Ans. (iii) A is True but R is False

18. **Assertion (A):** DataFrame has both a row and column index.
    Reason (R): A DataFrame is a two-dimensional labelled data structure like a table of MySQL. (1)
Ans. (i) Both A and R are true and R is the correct explanation for A

Section B

19. Explain the terms Web page and Home Page. (2)

    OR

    Mention any four networking goals.

Ans. **Web Page:** A Web Page is a part of a website and is commonly written in HTML. It can be accessed through a web browser.

Home Page: It is the first web page you see when you visit a website.

    OR

Four networking goals are:
 (i) Resource sharing
 (ii) Reliability
 (iii) Cost effective
 (iv) Fast data sharing

20. Rashmi, a database administrator, needs to display house wise total number of records of '**Red**' and '**Yellow**' house. She is encountering an error while executing the following query: (2)

```
SELECT HOUSE, COUNT (*) FROM STUDENT GROUP BY HOUSE WHERE HOUSE='RED' OR
HOUSE='YELLOW';
```

Help her in identifying the reason of the error and write the correct query by suggesting the possible correction(s).

Ans. The problem with the given SQL query is that WHERE clause should not be used with Group By clause. To correct the error, HAVING clause should be used instead of WHERE.

Corrected Query:

```
SELECT HOUSE, COUNT(*) FROM STUDENT GROUP BY HOUSE HAVING HOUSE= 'RED' OR
HOUSE='YELLOW';
```

21. What is the purpose of Order By clause in SQL? Explain with the help of suitable example. (2)

Ans. **Order By clause:**

The ORDER BY command is used to sort the result set in ascending or descending order. The following SQL statement displays all the customer's names in alphabetical order:

```
SELECT Cname FROM Customers ORDER BY Cname;
```

22. Write a program to create a series object using a dictionary that stores the number of students in each house of class 12D of your school. (2)

Note: Assume four house names are Beas, Chenab, Ravi and Satluj having 18, 2, 20, 18 students respectively and pandas library has been imported as pd.

Ans.
```
St={'Beas':18,'Chenab':20,'Ravi':20,' Satluj':18}
S1=pd.Series(St)
```

23. List any four benefits of e-waste management. (2)

    OR

    Mention any four net etiquettes.

Ans. The e-waste management:
 (i) Saves the environment and natural resources
 (ii) Allows for recovery of precious metals
 (iii) Protects public health and water quality
 (iv) Saves landfill space

    OR

 (i) No copyright violation
 (ii) Share the expertise with others on the internet
 (iii) Avoid cyberbullying
 (iv) Respect other's privacy and diversity

24. What will be the output of the following code: (2)

```
>>>import pandas as pd
>>>A=pd.Series(data=[35,45,55,40])
>>>print(A>45)
```

Ans.
```
0    False
1    False
2    True
3    False
```

25. Carefully observe the following code: (2)

```
import pandas as pd
Year1={'Q1':5000,'Q2':8000,'Q3':12000,'Q4': 18000}
Year2={'A':13000,'B':14000,'C':12000}
totSales={1:Year1, 2:Year2}
df=pd.DataFrame(totSales)
print(df)
```

Answer the following:

(i) List the index of the DataFrame df

(ii) List the column names of DataFrame df.

Ans. (i) The index labels of df will include Q1, Q2, Q3, Q4, A, B, C

(ii) The column names of df will be: 1, 2

Section C

26. Write outputs for SQL queries (i) to (iii) which are based on the given table PURCHASE: (3)

Table: Purchase

CNO	CNAME	CITY	QUANTITY	DOP
C01	GURPREET	NEW DELHI	150	2022-06-11
C02	MALIKA	HYDERABAD	10	2022-02-19
C03	NADAR	DALHOUSIE	100	2021-12-04
C04	SAHIB	CHANDIGARH	50	2021-10-10
C05	MEHAK	CHANDIGARH	15	2021-10-20

(i) `SELECT LENGTH(CNAME) FROM PURCHASE WHERE QUANTITY>100;`

(ii) `SELECT CNAME FROM PURCHASE WHERE MONTH(DOP)=3;`

(iii) `SELECT MOD (QUANTITY, DAY(DOP)) FROM PURCHASE WHERE CITY='CHANDIGARH';`

Ans. (i) 8

(ii) `No Output`

(iii) 0
     15

27. Write a Python code to create a DataFrame with appropriate column headings from the list given below: (3)

```
[[101,'Gurman',98],[102,'Rajveer',95],[103,'Samar',96],[104,'Yuvraj',88]]
```

Ans.
```
import pandas as pd
data=[[101,'Gurman',98],[102,'Rajveer',95],[103,'Samar',96],
     [104,'Yuvraj',88]]
df=pd.DataFrame(data,columns=['Rno','Name', 'Marks'])
```

28. Consider the given DataFrame 'Stock': (3)

```
     Name                  Price
0    Nancy Drew            150
1    Hardy boys            180
2    Diary of a wimpy kid  225
3    Harry Potter          500
```

Write suitable Python statements for the following:
  (i) Add a column called Special_Price with the following data: [135,150,200,440].
  (ii) Add a new book named 'The Secret' having price 800.
  (iii) Remove the column Special_Price.

Ans. (i) `Stock['Special_Price']=[135,150,200,400]`
  (ii) `Stock.loc['4']=['The Secret',800]`
  (iii) `Stock=Stock.drop('Special_Price',axis=1)`

29. Nadar has recently shifted to a new city and school. She does not know many people in her new city and school. But all of a sudden, someone is posting negative, demeaning comments on her social networking profile, etc. (3)

She is also getting repeated mails from unknown people. Every time she goes online, she finds someone chasing her online.
  (i) What is happening to Nadar?
  (ii) What immediate action should she take to handle it?
  (iii) Is there any law in India to handle such issues? Discuss briefly.

OR

What do you understand by plagiarism? Why is it a punishable offence? Mention any two ways to avoid plagiarism.

Ans. (i) Nadar has become a victim of cyberbullying and cyberstalking.
  (ii) She must immediately bring it to the notice of her parents and school authorities. And she must report this cybercrime to local police with the help of her parents.
  (iii) Yes. The Information Technology Act, 2000 (also known as ITA-2000, or the IT Act) is the primary law in India dealing with cybercrime and electronic commerce.

OR

Plagiarism is the act of using or stealing someone else's intellectual work, ideas, etc., and passing it as your own work. In other words, plagiarism is a failure in giving credit to its source.

Plagiarism is a fraud and violation of Intellectual Property Rights. Since IPR holds a legal entity status, violating its owner's right is a legally punishable offence.

Any two ways to avoid plagiarism:
  • Be original
  • Cite/acknowledge the source

30. Based on table STUDENT given here, write suitable SQL queries for the following: (3)

Roll No	Name	Class	Gender	City	Marks
1	Abhishek	XI	M	Agra	430
2	Prateek	XII	M	Mumbai	440
3	Sneha	XI	F	Agra	470
4	Nancy	XII	F	Mumbai	492
5	Himnashu	XII	M	Delhi	360
6	Anchal	XI	F	Dubai	256
7	Mehar	X	F	Moscow	324
8	Nishant	X	M	Moscow	429

  (i) Display gender-wise highest marks.
  (ii) Display city-wise lowest marks.
  (iii) Display total number of male and female students.

OR

Discuss the significance of Group by clause in detail with the help of suitable example.

Ans. (i) `select max(marks) from student group by gender;`

(ii) `select min(marks) from student group by city;`

(iii) `select gender,count(gender) from student group by gender;`

       OR

GROUP BY clause is used in a SELECT statement in combination with aggregate functions to group the result based on distinct values in a column.

Example:

To display total number of male and female students from the table STUDENT, we need to first group records based on the gender and then we should count records with the help of count() function.

Considering the following table STUDENT:

Roll No	Name	Class	Gender	City	Marks
1	Abhishek	XI	M	Agra	430
2	Prateek	XII	M	Mumbai	440
3	Sneha	XI	F	Agra	470
4	Nancy	XII	F	Mumbai	492
5	Himnashu	XII	M	Delhi	360
6	Anchal	XI	F	Dubai	256
7	Mehar	X	F	Moscow	324
8	Nishant	X	M	Moscow	429

SQL query for the above-mentioned task is as follows:

`select gender,count(gender) from student group by gender;`

Output:

```
 Gender      Count(Gender)
    M              4
    F              4
```

<div align="center">

Section D

</div>

31. Write suitable SQL query for the following: (5)

(i) Display 7 characters extracted from 7th left character onwards from the string 'INDIA SHINING'.

(ii) Display the position of occurrence of string 'COME' in the string 'WELCOME WORLD'.

(iii) Round off the value 23.78 to one decimal place.

(iv) Display the remainder of 100 divided by 9.

(v) Remove all the expected leading and trailing spaces from a column userid of the table 'USERS'.

       OR

Explain the following SQL functions using suitable examples.

(i) `UCASE()`

(ii) `TRIM()`

(iii) `MID()`

(iv) `DAYNAME()`

(v) `POWER()`

Ans. (i) `select mid('INDIA SHINING',7,7);`

(ii) `select INSTR('WELCOME WORLD','COME');`

(iii) `select round(23.78,1);`

(iv) `select mod(100,9);`

(v) `select trim(userid) from users;`

       OR

Ans. 1. **UCASE():** It converts the string into upper case.

   Example:
   ```
   SELECT UCASE('welcome world');
   ```
   Output:
   ```
   WELCOME WORLD
   ```

   2. **TRIM():** It removes the leading and trailing spaces from the given string.

   Example:
   ```
   SELECT TRIM('Welcome world');
   ```
   Output:
   ```
   WELCOME WORLD
   ```

   3. **MID():** It extracts the specified number of characters from given string.

   Example:
   ```
   SELECT MID('Welcome world,4,,4);
   ```
   Output:
   ```
   Come
   ```

   4. **DAYNAME():** It returns the weekday name for a given date

   Example:
   ```
   SELECT DAYNAME('2022-07-22');
   ```
   Output:
   ```
   Friday
   ```

   5. **POWER():** It returns the value of a number raised to the power of another number.

   Example:
   ```
   SELECT POW(6,2);
   ```
   Output:
   ```
   36
   ```

32. Prime Computer Services Ltd. is an international educational organization. It is planning to set up its India campus at Mumbai with its head office in Delhi. The Mumbai office campus has four main buildings—ADMIN, ACCOUNTS, EXAMINATION and RESULT. (5)

You as a network expert have to suggest the best network related solutions for their problems raised in (i) to (v), keeping in mind the distances between the buildings and other given parameters.

DELHI HEAD OFFICE	MUMBAI CAMPUS	
	EXAMINATION	ACCOUNTS
	ADMIN	RESULT
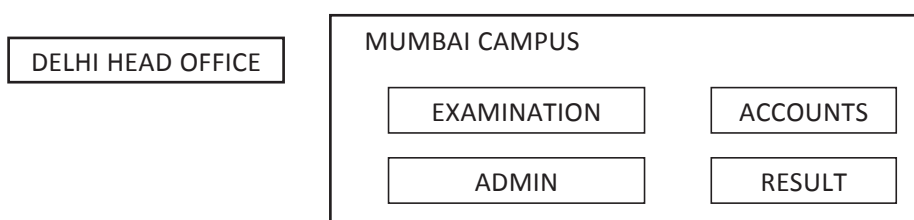
Shortest distances between various buildings:

ADMIN TO ACCOUNTS	55 m
ADMIN TO EXAMINATION	90 m
ADMIN TO RESULT	50 m
ACCOUNTS TO EXAMINATION	55 m
ACCOUNTS TO RESULT	50 m
EXAMINATION TO RESULT	45 m
DELHI Head Office to MUMBAI campus	2150 m

Number of computers installed at various buildings are as follows:

ADMIN	110
ACCOUNTS	75
EXAMINATION	40
RESULT	12
DELHI HEAD OFFICE	20

  (i) Suggest the most appropriate location of the server inside the MUMBAI campus (out of the four buildings) to get the best connectivity for maximum number of computers. Justify your answer.
 (ii) Suggest and draw cable layout to efficiently connect various buildings within the MUMBAI campus for a wired connectivity.
(iii) Which networking device will you suggest to be procured by the company to interconnect all the computers of various buildings of MUMBAI campus?
(iv) Company is planning to get its website designed which will allow students to see their results after registering themselves on its server. Out of the static or dynamic, which type of website will you suggest?
 (v) Which of the following will you suggest to establish the online face-to-face communication between the people in the ADMIN office of Mumbai campus and DELHI head office?
    (a) Cable TV   (b) Email   (c) Video conferencing   (d) Text chat
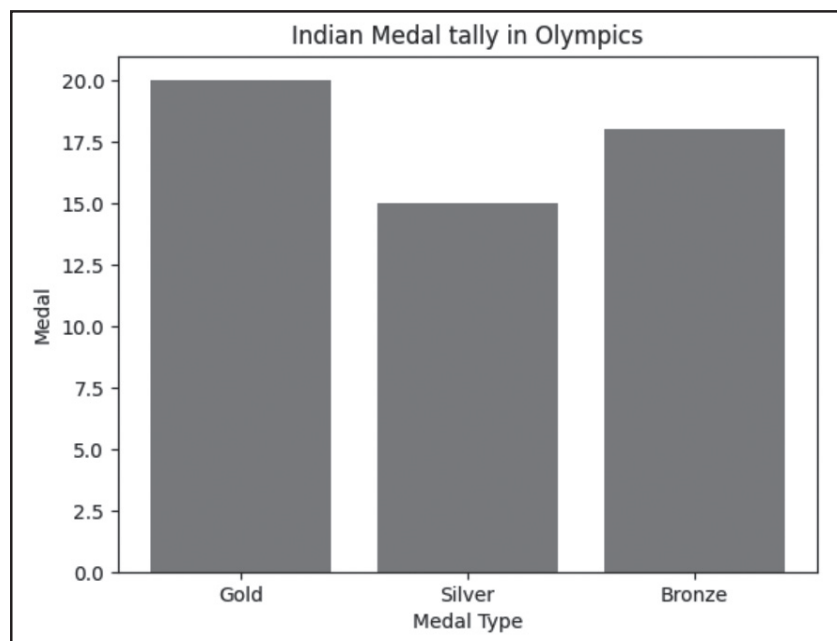
Ans.   (i) Server should be installed in Admin department as it has maximum number of computers.
 (ii) Star Topology
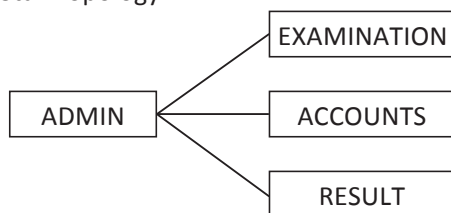
(iii) Hub/Switch
(iv) Dynamic
 (v) Video conferencing

33. Write Python code to plot a bar chart for India's medal tally as shown below: (5)

Also give suitable Python statement to save this chart.

OR

Write a Python program to plot a line chart based on the given data to depict the changing weekly average temperature in Delhi for four weeks.

```
Week=[1,2,3,4]
Avg_week_temp=[40,42,38,44]
```

Ans.
```
import matplotlib.pyplot as plt
Category=['Gold','Silver','Bronze']
Medal=[20,15,18]
plt.bar(Category,Medal)
plt.ylabel('Medal')
plt.xlabel('Medal Type')
plt.title('Indian Medal tally in Olympics')
plt.show()
```

Python statement to save the chart:
```
plt.savefig("aa.jpg")
```

OR

Ans.
```
import matplotlib.pyplot as plt
Week=[1,2,3,4]
Avg_week_temp=[40,42,38,44]
plt.plot(Week,Avg_week_temp)
plt.show()
```

Section E

34. Shreya, a database administrator, has designed a database for a clothing shop. Help her by writing answers of the following questions based on the given table: (1+1+2)

Table: CLOTH

CCODE	CNAME	SIZE	COLOR	PRICE	DOP
C001	JEANS	XL	BLUE	990	2022-01-21
C002	T SHIRT	M	RED	599	2021-12-12
C003	TROUSER	M	GREY	399	2021-11-10
C004	SAREE	FREE	GREEN	1299	2019-11-12
C005	KURTI	L	WHITE	399	2021-12-07

(i) Write a query to display cloth names in lower case.
(ii) Write a query to display the lowest price of the cloths.
(iii) Write a query to count total number of cloths purchased of medium size.

OR (Option for part iii only)

Write a query to count year-wise total number of cloths purchased.

Ans. (i) `SELECT LOWER(CNAME) FROM CLOTH;`
(ii) `SELECT MIN(PRICE) FROM CLOTH;`
(iii) `SELECT COUNT(*)FROM CLOTH GROUP BY SIZE HAVING SIZE='M';`

OR

`SELECT YEAR(DOP),COUNT(*) FROM CLOTH GROUP BY YEAR(DOP);`

35. Mr. Som, a data analyst, has designed the DataFrame df that contains data about Computer Olympiad with 'CO1', 'CO2', 'CO3', 'CO4', 'CO5' as indexes shown below. Answer the following questions: (1+1+2)

	School	Tot_students	Topper	First_Runnerup
CO1	PPS	40	32	8
CO2	JPS	30	18	12
CO3	GPS	20	18	2
CO4	MPS	18	10	8
CO5	BPS	28	20	8

(A) Predict the output of the following python statement:

(i) `df.shape`   (ii) `df[2:4]`

(B) Write Python statement to display the data of Topper column of indexes CO2 to CO4.

OR (Option for part iii only)

Write Python statement to compute and display the difference of data of Tot_students column and First_Runnerup column of the above given DataFrame.

Ans. (A) Output:

(i) (5,4)

(ii)

	School	tot_students	Topper	First_Runner_up
CO3	GPS	20	18	2
CO4	MPS	18	10	8

(B) Python statement:

```
print(df.loc['CO2': 'CO4', 'Topper'])
```

OR

```
print(df.Tot_students-df.First_Runnerup)
```