

**CLASS XII**  
**HALF YEARLY EXAMINATION (2023-2024)**  
**Subject: Informatics Practices**

**Time: 3 Hours**

**MM: 70**

**General Instructions:**

- This question paper contains five sections, Section A to E.
- All questions are compulsory.
- Section A have 18 questions carrying 01 mark each.
- Section B has 07 Very Short Answer type questions carrying 02 marks each.
- Section C has 05 Short Answer type questions carrying 03 marks each.
- Section D has 02 questions carrying 04 marks each.
- Section E has 03 Long Answer type questions carrying 05 marks each.

**SECTION –A**

**Q1)** The attack that focuses on capturing small packets from the network transmitted by other computers and reading the data content in search of any type of information is \_\_\_\_\_.

- a) Phishing                      b) Eavesdropping                      c) Scams                      d) PC intrusion

**Q2)** Predict the output of the following query:

SELECT MOD (9,0);

**Q3)** 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 following query:

SELECT DEPT, AVG(SAL) FROM EMP WHERE COUNT (\*) > 5 GROUP BY DEPT;

Which of the following is a correct query to perform the given task?

- a) SELECT DEPT, AVG(SAL) FROM EMP WHERE COUNT (\*) > 5 GROUP BY DEPT;  
b) SELECT DEPT, AVG(SAL) FROM EMP HAVING COUNT (\*) > 5 GROUP BY DEPT;  
c) SELECT DEPT, AVG(SAL) FROM EMP GROUP BY DEPT WHERE COUNT (\*) > 5;  
d) SELECT DEPT, AVG(SAL) FROM EMP GROUP BY DEPT HAVING COUNT (\*) > 5;

**Q4)** In SQL, the equivalent of UCASE () is:

- a) UPPERCASE ()      b) CAPITALCASE()                      c) UPPER()                      d) TITLE()

**Q5)** The generally recognized term for the government protection afforded to intellectual property (written and electronic) is called \_\_\_\_\_.

- a) Computer Security Law                      b) aggregate functions  
c) Copyright law                      d) data security standards

**Q6)** Predict the output of the following query:

SELECT LCASE (MONTHNAME ('2023-03-05'));

**Q7)** What will be the output of the given code?

```
import pandas as pd
s = pd.Series([1,2,3,4,5],
index=['akram','brijesh','charu','deepika','era'])
print(s['charu'])
```

**Q8)** Every activity you perform on the internet is saved for how long?

- a) one month                      b) one year                      c) forever                      d) as per my setting

**Q9)** Which of the following SQL functions does not belong to the Math functions category?

- a) POWER()                      b) ROUND()                      c) LENGTH()                      d) MOD()

**Q10)** In URL, <http://www.somestore.com/firstfloor/shoes.htm>, which component identifies the protocol or type of the server?

**Q11)** A male or message sent to a large number of people indiscriminately without their consent is called \_\_\_\_\_.

**Q12)** With reference to SQL, identify the invalid data type.

- a) date                      b) integer                      c) year                      d) month

**Q13)** Ritika is a new learner for the python pandas, and she is aware of some concepts of python. She has created some lists, but is unable to create the data frame from the same. Help her by identifying the statement which will create the data frame.

import pandas as pd

```
Name=['Manpreet','Kavil','Manu','Ria']
```

```
Phy=[70,60,76,89]
```

```
Chem=[30,70,50,65]
```

```
a) df=pd.DataFrame({"Name":Name,"Phy":Phy,"Chem":Chem})
```

```
b) d=({"Name":Name,"Phy":Phy,"Chem":Chem})
```

```
df=pd.DataFrame(d)
```

```
c) df=pd.DataFrame([Name,Phy,Chem],columns=['Name','Phy','Chem',"Total"])
```

```
d) df=pd.DataFrame({Name:"Name", Phy : "Phy",Chem: "Chem"})
```

**Q14)** Which topology contains a backbone cable running through the whole length of the network?

**Q15)** Which of the following is not a part of URL?

- a) IP address                      b) Port Number                      c) Domain Name                      d) None of these

**Q16)** FLOSS stand for \_\_\_\_\_.

**Q17 and 18** are ASSERTION AND REASONING based questions. Mark the correct choice as

- 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

**Q17) Assertion (A):** - pandas is an open-source Python library which offers high performance, easy-to-use data structures and data analysis tools.

**Reasoning (R):** - Professionals and developers are using the pandas library in data science and machine learning.

**Q18) Assertion (A):** - Data visualization refers to the graphical representation of information and data using visual elements like charts, graphs, and maps etc.

**Reasoning (R):** - To install matplotlib library we can use the command  
pip install matplotlib.

### SECTION-B

**Q19)** For web pages where the information is changed frequently, for example, stock prices, weather information which out of the following options would you advice?

- a) Static Webpage                      b) Dynamic Webpage

Justify your answer.

**Q20)** The python code written below has syntactical errors. Rewrite the correct code and underline the corrections made.

```
Import pandas as pd
```

```
df={"Technology":["Programming","Robotics","3DPrinting"],"Time(in months)":[4,4,3]}
```

```
df= Pd.dataframe(df)
```

```
Print(df)
```

**Q21)** Aryan, a database administrator, has grouped records of a table with the help of group by clause. He needs to further filter groups of records generated through group by clause. Suggest suitable clause for it and properly explain its usage with the help of an example.

**Q22)** Create a DataFrame in Python from the given list:

```
[['Divya','HR',95000],[ 'Mamta','Marketing',97000],[ 'Payal','IT',980000], [ 'Deepak','Sales',79000]]
```

Also give appropriate column headings.

**Q23)** Nivedita has recently shifted to a new city and new school. She doesn't 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, school site's forum etc. She is also getting repeated mails from unknown people. Every time she goes online, she finds someone chasing her online.

- a) What is happening with Nivedita?  
b) What action should she take to stop them?

OR

Mention any two health hazards associated with inappropriate and excessive use of gadgets.

**Q24)** Find the output of the following code: -

```
Stationery = ['pencils', 'notebooks', 'scales', 'erasers']
```

```
S = pd. Series ([20, 33, 52, 10], index = Stationery)
```

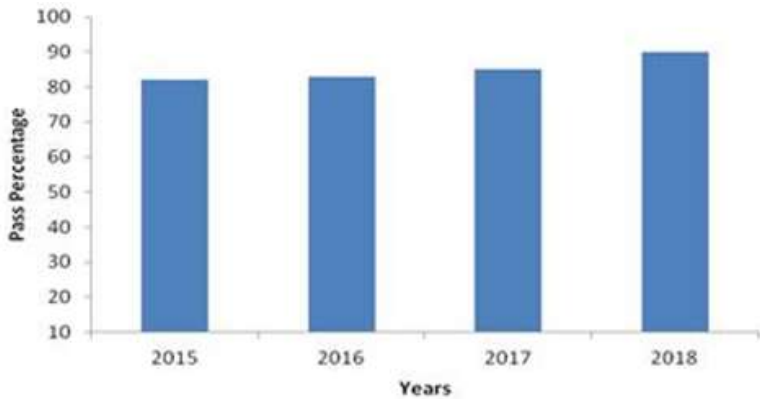
```
S2 = pd. Series ([17, 13, 31, 32], index = Stationery)
```

```
print (S + S2)
```

```
S = S + S2
```

```
print (S + S2)
S[0:2] = 12
print(S)
```

**Q25)** Write a code to plot a bar chart to depict the pass percentage of students in CBSE exams for the years 2015 to 2018 as shown below-



### SECTION-C

**Q26)** Predict the output of the following queries:

- select instr('exams@cbse.nic.in','.');
- select substr('exams@cbse.nic.in',7,4);
- select left('exams@cbse.nic.in',5);

**Q27)** 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.

**Q28)** Based on the SQL table CAR\_SALES, write suitable queries for the following:

NUMBER	SEGMENT	FUEL	QT1	QT2
1	Compact HatchBack	Petrol	56000	70000
2	Compact HatchBack	Diesel	34000	40000
3	MUV	Petrol	33000	35000
4	MUV	Diesel	14000	15000
5	SUV	Petrol	27000	54000
6	SUV	Diesel	18000	30000
7	Sedan	Petrol	8000	10000
8	Sedan	Diesel	1000	5000

- Display fuel wise average sales in the first quarter.
- Display segment wise highest sales in the second quarter.
- Display the records in the descending order of sales in the second quarter.

OR

Predict the output of the following queries based on the table CAR\_SALES given above:

- SELECT LEFT(SEGMENT,2) FROM CAR\_SALES WHERE FUEL="PETROL";
- SELECT (QT2-QT1)/2 "AVG SALE" FROM CAR\_SALES WHERE SEGMENT= "SUV";
- SELECT SUM(QT1) "TOT SALE" FROM CAR\_SALES WHERE FUEL= "DIESEL";

**Q29)** Internet security is a major issue for many people. The following is a list of four typical security issues:

- Pharming
- Phishing
- Spyware
- Virus

For any three, describe the security issue and suggest a way of protecting against it.

**Q30)** Write MySQL statements for the following:

- To create a database named FOOD.
- To create a table named Nutrients based on the following specification:

Column Name	Data Type	Constraints
Food_Item	Varchar(20)	Primary Key
Calorie	Integer	-

#### SECTION-D

**Q31)** Preeti manages database in a blockchain start-up. For business purposes, she created a table named BLOCKCHAIN. Assist her by writing the following queries:

TABLE: BLOCKCHAIN

id	user	Value	hash	Transaction_date
1	Steva	900	ERTY	2020-09-23
2	Meesha	145	@3456	2021-03-12
3	Nimisha	657	#fbvfk dj	2020-05-06
4	Pihu	798	Rrfdv*	2022-05-15
5	Kopal	567	wer@4	2021-03-29
6	Palak	356	%vshlj	2022-11-02

- 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 in the year 2022.

**Q32)** Ekam, a Data Analyst with a multinational brand has designed the DataFrame df that contains the four quarter's sales data of different stores as shown below:

STORE	Qtr1	Qtr2	Qtr3	Qtr4
STORE1	300	240	450	230
STORE2	350	340	403	210
STORE3	250	180	145	160

Answer the following questions:

- Predict the output of the following python statement:
  - `print(df.size)`
  - `print(df[1:3])`
- Delete the last row from the DataFrame.
- Write Python statement to add a new column Total\_Sales which is the addition of all the 4 quarter sales.

OR

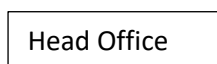
(Option for part iii only)

Write Python statement to export the DataFrame to a CSV file named data.csv stored at D: drive.

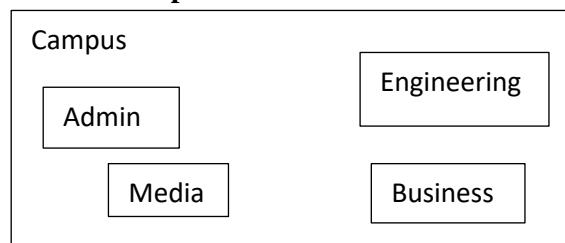
#### SECTION-E

**Q33)** Gargi Education Services Ltd. Is an educational organisation. It is planning to set up its in India campus at Nepal with its head office at Mumbai. The Nepal campus has 4 main buildings – Admin, Engineering, Business, and Media. You as an Network expert have to suggest the best network related solutions for their problems raised in (a) to (e), keeping in mind the distance between the buildings and the other given parameters.

**Mumbai**



**Nepal**



**Shortest distance between various buildings:-**

Admin to Engineering – 50m

Admin to Business – 80m

Engineering to Business – 60m

Admin to Media – 45m

Engineering to media – 50m

Business to Media – 45m

Mumbai Head office to Nepal Campus – 2175m

**Number of computers installed at various buildings are as follows: -**

Admin – 110

Engineering – 75

Business – 40

Media – 10

Mumbai head office – 20

- Suggest the most appropriate location of the server inside the Nepal Campus (out of 4 buildings), to get best connectivity for maximum number of computers. Justify your answer.
- Suggest and draw the cable layout to efficiently connect various buildings within the Nepal campus for connecting the computers.
- Which hardware device will you suggest to be procured by the company to be installed to protect and control the internet uses within the campus.
- Which of the following will you suggest establish face to face communication between the people in the Admin office of Nepal campus and Mumbai head office?
  - Cable TV
  - E-mail
  - Video Conferencing
  - Text chat
- Expand the following
  - MAN
  - PAN

**Q34)** Why is the following code not renaming the index and columns even when code is executing without any error, considering that the sale Df dataframe is as shown on the right.

```
>>> saleDf
```

	Target	Sales
Zone B	70000	68000
Zone C	75000	78000
Zone D	60000	61000

The code:

```
saleDf.rename(index = {'zoneC': 'Central', 'zoneD': 'Dakshin'}, columns = {'Target': 'Targeted', 'Sales': 'Achieved'})  
print(saleDf)
```

What output would be produced by the above code and what is the problem with the code? What correction/modification would you suggest for the problem.

**Q35)** Write the SQL functions which will perform the following operations:

- To display the name of the weekday for your date of birth
- To convert e-mail-id to lowercase
- To count the number of characters in your name
- To display the first character of your name
- To calculate the average marks secured by the class

OR

Kabir has created following table named exam:

RegNo	Name	Subject	Marks
1	Sanya	CS	98
2	Sanchay	IP	100
3	Vinesh	CS	56
5	Akshita	IP	98

Help him in writing SQL queries to the perform the following task:

- Insert a new record in the table having following values:  
[6,'Khushi','CS',85]
- To change the value “IP” to “Informatics Practices” in subject column.
- To remove the records of those students whose marks are less than 30.
- To add a new column Grade of suitable datatype.
- To display records of “Informatics Practices” subject.