



BK BIRLA CENTRE FOR EDUCATION
SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL
PRE BOARD -01 EXAMINATION 2023-24



INFORMATICS PRACTICES (065)
MARKING SCHEME

Class : XII SCIENCE/COMMERCE/ARTS
Date : 19-12-2023
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Duration : 3 Hrs
Max. Marks : 70
Roll No.:

Section-A

1. How can individuals protect themselves from identity theft ? 1
(a) Share personal information freely on social media (b) Use the same password for all online accounts (c) Never check bank statements (d) Shred sensitive documents, use strong passwords, and monitor financial accounts
2. Which Python command can be utilized to create a histogram using the data in a list named that represents scores of students in an exam ? 1
(a) plt.hist(values) (b) seaborn.histplot(values) (c) plt.plot_histogram(values)
(d) numpy.histogram(values)
3. Which network topology typically results in less wire length usage as compared to others ? 1
(a) Star topology (b) Mesh topology (c) Bus topology (d) Hybrid topology
4. _____ is a cyber-attack method that involves sending fraudulent emails or messages to trick individuals into revealing sensitive information, such as login credentials or financial data ? 1
(a) Malware Infection (b) DDoS Attack (c) Phishing (d) SQL Injection
5. Which environmental issue is associated with electronic waste? 1
(a) Ocean Acidification (b) Air Pollution (c) Noise Pollution (d) Water Scarcity
6. To get the number of dimensions of a Series object, _____ attribute is displayed. 1
(a) Index (b) Size (c) Itemsize (d) Ndim
7. What will be correct syntax for pandas series? 1
(a) pandas_Series(data, index, dtype) (b) panda.series(data, index, dtype)
(c) pandas.Series(data, index, dtype) (d) panda_Series(data, index, dtype)
8. To display third element of a Series object S, you will write _____ . 1
import pandas as pd
list1=[10,20,30,40,50]
S = pd.Series(list1)
print(S[])
(a) S[:3] (b) S[2] (c) S[3] (d) S[:2]
9. Which of the following command will show the last 3 rows from a Pandas Series named NP? 1
(a) NP.Tail() (b) NP.tail(3)
(c) NP.TAIL(3) (d) All of the above

10. Assertion **(A)** Cookies are small text files stored locally by the client's web browser to remember the "name value pair" that identifies the client. 1
Reason **(R)** Cookies are primarily used to track users' physical locations.
(a) Both A and R are true and R is the correct explanation for A
(b) Both A and R are true but R is not the correct explanation for A
(c) A is True but R is False
(d) A is false but R is True
11. In SQL, which of the following will select only one copy of each set of duplicate rows from a table. 1
(a) SELECT UNIQUE **(b) SELECT DISTINCT** (c) SELECT DIFFERENT (d) All of these.
12. Which operator can take wild card characters for query condition? 1
(a) BETWEEN **(b) LIKE** (c) IN (d) NOT
13. Repeaters work on the _____ layer. 1
(a) Network Layer **(b) Physical Layer** (c) Application Layer (d) All of the Above
14. Assertion (A) DataFrame and its size is mutable in Pandas. 1
Reasoning(R) Data in a Series is organized in a single column.
(a) Both A and R are true and R is the correct explanation for A
(b) Both A and R are true but R is not the correct explanation for A
(c) A is True but R is False
(d) A is false but R is True
15. Identify FOSS from the following: 1
(a) MS Windows (b) CorelDraw (c) Photoshop **(d) Linux**
16. Which of the following is not protected through Intellectual Property Rights (IPR) ? 1
(a) Literary works **(b) Real estate properties** (c) Trademarks (d) Patented inventions
17. _____ is a networking device which can analyze the data being carried over a network, decide or alter how it is packaged, and send it to another network of a different type. 1
(a) Modem (b) Hub **(c) Router** (d) Switch
18. In which type of join, the join condition contains an equality operator ? 1
(a) Equijoin (b) Natural (c) Left Join (d) Right Join

Section- B

19. Rashi has just started using internet. Mention her any four net etiquette which she should follow in order to become a good netizen. 2
OR
Mention any four communication etiquette which one should follow while communicating on the internet.

Ans: No copyright violation. Share your expertise with others on the internet. Avoid cyberbullying. Respect others' privacy and diversity.

Or

Make sure identification is clear in all communications.

Review what you wrote and try to interpret it objectively.

If you wouldn't say it face to face, don't say it online.

Don't assume everyone understands where you're coming from.

Don't spam.

Use emoticons.

Respect others' privacy.

Remember, if it's on the internet, it's everywhere.

Follow the rules.

Forgive and forget.

20. Mr. Ankit is working in an organisation as data analyst. He uses Python Pandas and Matplotlib for the same. He got a dataset of the passengers for the year 2010 to 2012 for January, March and December. His manager wants certain information from him, but he is facing some problems. Help him by answering few questions given below:

	Year	Month	Passengers
0	2010	Jan	25
1	2010	Mar	50
2	2012	Jan	35
3	2010	Dec	55
4	2012	Dec	65

2

Complete the code to create the above data frame:

```
import pandas as _____ #Statement 1
data={"Year":[2010,2010,2012,2010,2012],"Month":["Jan","Mar","Jan","Dec","Dec"],"Passengers":[25,50,35,55,65]}
df=pd._____ (data) #Statement 2
print(df)
```

Ans. pd, DataFrame

21. Consider the given SQL QUERIES:
- (i) To retrieve the length of the given string "CBSE BOARD SQP 2023!", which SQL function should you use?
- (ii) To findout if symbol is present in the values of email id column or not, which function out of the follow ing should be used?

2

Ans: LENGTH() function, INSTR() function

22. Gaytri, a data analyst has stored four employee's name and their employee code in four dictionaries Structure of one such dictionary is as follows:

```
Emp1={'Ename': 'Emp Name', 'Ecode ':'Employee code'}
```

She clubbed these four dictionary into a list.

Write suitable Python code to store the required data of four employees in the form of list of dictionaries and create a DataFrame with appropriate column headings as shown below:

	Ename	Ecode
0	John	88
1	Emily	92
2	Michael	78
3	Sophia	95

Ans:

```
employee1 = {'ename': 'Alice', 'ecode': 'E101'}
employee2 = {'ename': 'Bob', 'ecode': 'E102'}
employee3 = {'ename': 'Charlie', 'ecode': 'E103'}
employee4 = {'ename': 'David', 'ecode': 'E104'}
# Creating a dictionary with 'ename' and 'ecode' keys
```

```

employee_dict = { 'employee1': {'ename': employee1['ename'], 'ecode':
employee1['ecode']}, 'employee2': {'ename': employee2['ename'], 'ecode':
employee2['ecode']}, 'employee3': {'ename': employee3['ename'], 'ecode':
employee3['ecode']}, 'employee4': {'ename': employee4['ename'], 'ecode':
employee4['ecode']}
}
# Print the resulting dictionary
print(employee_dict)

```

23. Choose the most appropriate wireless communication channel in each of the following situations :

2

(i) Communication in hilly area.

(ii) Very fast communication between two offices in two different countries.

OR

Define the term hub. Also explain the brief active hubs and passive hubs.

Ans: (i) A wireless communication channel that is suitable for non-line-of-sight scenarios would be ideal. In such cases, radio frequency communication using technologies like Zigbee or LoRa (Long Range) might be appropriate.

(ii) A high-speed and reliable wireless communication channel is needed. In this scenario, a dedicated high-speed broadband connection, such as a fiber optic link, might be the most appropriate. Fiber optic cables can transmit data at extremely high speeds and are known for low latency, making them suitable for fast and reliable communication between distant locations. Satellite communication can also be considered, but it often has higher latency compared to fiber optics. The choice may depend on factors like cost, availability, and specific communication requirements.

OR

A hub refers to a basic networking device that connects multiple devices in a local area network (LAN).

Active Hub:

An active hub, also known as a "powered hub," includes repeaters and signal regeneration capabilities.

Passive Hub:

A passive hub, also known as an "unpowered hub" or "dumb hub," does not require an external power source.

24. Find the output of the following code:

2

```

import pandas as pd
lst1=[20,35,40]
ser1=pd.Series([20,35,40])
print(lst1+lst1)
print(ser1+ser1)

```

Ans: # Output for list addition

```
print(lst1 + lst1)
```

```
# Output: [20, 35, 40, 20, 35, 40]
```

```
# Output for Series addition
```

```
print(ser1 + ser1)
```

Output:

```
0 40
```

```
1 70
```

```
2 80
```

25. Predict the output of the following queries : 2
- SELECT INSTR(RIGHT('EXAM@2022', '2');
 - SELECT MID('KENDRIYA VIDYALAYA',10,5);

OR

Write any two Date/Time Function in SQL with proper example ?

Ans: i) 22 ii) VIDYA

OR

DATE_FORMAT Function (MySQL):

SELECT DATE_FORMAT(NOW(), '%Y-%m-%d %H:%i:%s') AS formatted_datetime;

Section-C

26. Predict the output of the following queries: 3
- SELECT CONCAT(LEFT('India',5), RIGHT('is my country',7));
 - SELECT INSTR('Informatics Practices@2022','for')+45;
 - SELECT CONCAT(LEFT('Knowledge'4),' Your abilities');

OR

Mr. Raman is working on a MySQL table named 'Stock having following structure:

He need to perform following task on the table:

- To fetch First 4 characters from the PNAME column.
- To display the Total Stock (Qty* Price) with PName.
- To display details of product whose price is more than 1200 .

Suggest suitable SQL function for the same. Also write the query to achieve the desired task.

- Indiacountry
- 48
- Know Your abilities

Ans. OR

- Select left(PNAME,4) from stock;
- Select Pname, sum(qty*price) as Total Stock from Stock;
- Select * from stock where price > 1200;

- 25 Consider the following records in 'Car' table and write the output of the given questions: 3

```
mysql> select * from car;
```

carid	make	model	year	colour	price
1	Toyota	Camry	2020	Silver	25000.00
2	Honda	Civic	2019	Blue	22000.50
3	Ford	Fusion	2021	Red	28000.75
4	Chevrolet	Malibu	2018	Black	20000.25
5	Nissan	Altima	2022	White	26000.00
6	BMW	3 Series	2020	Grey	35000.00

- SELECT Make, Model FROM Car WHERE Price>30000.00;
- SELECT COUNT(*) AS 'TotalCars' FROM Car WHERE Year = 2020;
- SELECT CarID, Make, Model FROM Car where price<22000;

Ans: (a) (b) 2 (c)

Make	Model
BMW	3 Series

CarID	Make	Model
4	Chevrolet	Malibu

26. What is the purpose of GROUP BY clause in MySQL? How is it different from ORDER BY clause? 3

Ans. The GROUP BY clause is used to group rows based on the values of one or more columns. It is often used in conjunction with aggregate functions such as SUM, COUNT, AVG, etc., to perform calculations on each group of rows.

The ORDER BY clause is used to sort the result set of a query based on one or more columns, either in ascending (ASC) or descending (DESC) order.

27. Imagine a scenario where an individual, Alex, is concerned about his online privacy. Alex has a social media presence and frequently posts updates, photos, and comments on various platforms. Additionally, Alex frequently uses mobile apps and visits websites for shopping and information.
- Explain the concept of an active digital footprint, providing examples from Alex's online activities.
 - Describe the concept of a passive digital footprint and provide examples of how it is generated in Alex's online interactions.
 - Discuss the implications of both active and passive digital footprints for Alex's online privacy and security.

OR

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.

- Ans. a. An active digital footprint refers to the intentional and voluntary information that an individual consciously shares or leaves online through their activities on various digital platforms. In the case of Alex, who is concerned about online privacy, his active digital footprint is the data he knowingly contributes to the digital realm. Alex actively maintains social media profiles on platforms like Facebook, Twitter, and Instagram. Examples:
Alex uses a fitness app that tracks his daily runs, storing information about his route, distance, and speed.

Alex participates in a tech forum, offering advice to others on a specific software-related issue.

b. A passive digital footprint refers to the data trail left by an individual without their direct, intentional input. Examples: Cookies and Tracking Pixels, Search Engine Queries, Social Media Analytics, Location Tracking, Online Advertisements etc

c. Privacy Risks: Sharing personal information intentionally on social media, forums, or other platforms may expose Alex to privacy risks. Alex's active participation in online activities, such as searches, clicks, and interactions, contributes to targeted advertising. Advertisers may use this data to tailor ads based on his preferences. Companies may aggregate and analyze Alex's active digital footprint to create user profiles. Information shared actively, such as birthdays, locations, or workplace details, can be used in social engineering attacks. Attackers may use this information to impersonate Alex or gain unauthorized access. Passive tracking through cookies, website analytics, and location data may result in a more invasive digital profile for Alex without his direct consent. The passive digital footprint, including IP addresses and device identifiers, can contribute to the loss of online anonymity, making it easier to trace Alex's online activities.

Passive data collected by various entities is stored in databases. If these databases are compromised in a data breach, sensitive information about Alex may be exposed. Passive digital footprints may contribute to broader surveillance efforts by governments or other

Ans. In conclusion, both active and passive digital footprints pose privacy and security challenges for Alex. Managing and mitigating these risks involve a combination of user awareness, informed decision-making, and the use of privacy-enhancing tools and practices. Alex should adopt a proactive approach to protect his online privacy and stay informed about evolving threats and best practices in digital security.

OR

The 3R's—Reduce, Reuse, and Recycle—are crucial principles for managing electronic waste (e-waste) responsibly. Here are three essential approaches along with practical examples of how individuals can actively participate in each: Purchase Wisely, Upgrade Instead of Replace, Donate or Sell, Repurposing etc

28. Write a program in python to create a DataFrame using any method like list, dictionary. 3

	A	B	C	D
Acct	99	94.0	92	97.0
Eco	90	94.0	92	97.0
Eng	95	89.0	91	89.0
IP	94	NaN	99	95.0
Math	97	100.0	99	NaN

Ans. `Dict={'A':[99,90,95,94,97],'B':[94,94,89,np.NaN,100],'C':[92,92,91,99,99],'D':[97,97,89,95,np.NaN]}`
`df=pd.DataFrame(doct1,index=['Acct','Eco','Eng','IP','Math'])`
`df`

Section-D

29. Wizbiz Corporation is recording the quarterly sales data of its three products through different departments. The data is as follows: 4

	Qtr1	Qtr2	Qtr3	Qtr4
Product1	3500	4200	4800	5100
Product2	2800	3100	3600	NaN
Product3	1500	1800	2100	2400
Product4	NaN	1500	1200	1500

Mr. Raj is tasked for writing a Python program. Help him to write correct code the create the DataFrame DF1:

Write a script that does the following:

(i) List the presence of missing data in whole DataFrame.

(ii) Fill the missing data with 999.

(iii) Print the DataFrame after filling missing value.

(iv) List the average sales of Qtr2

OR (Option for part iv only)

Write Python statement to display total sales done in ' and 'Qtr2 for each product.

Ans. (i) `print(df1.isnull())` , (ii) `df1=df1.fillna(999)`, (iii) `print(df1)`, (iv) `df1[Qtr2].mean()`

`total_sales_q2 = df1['Q2'].sum()`
`print(f'Total sales in Quarter 2: {total_sales_q2}')`

Or

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

4

TABLE: BLOCKCHAIN

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
6	Palakshi	534	wer@3	2022-11-29

- (i) Write a query to display the year of oldest transaction.
(ii) Write a query to display the month of most recent transaction.
(iii) Write a query to display all the transactions done in the month of May.
(iv) Write a query to count total number of transactions in the year 2022.

Ans: (i) `SELECT YEAR(MIN(transaction_date)) AS oldest_year
FROM BLOCKCHAIN ;`
(ii) `SELECT MONTH(MAX(transaction_date)) AS recent_month
FROM BLOCKCHAIN ;`
(iii) `SELECT * FROM BLOCKCHAIN WHERE MONTH(transaction_date) = 5;`
(iv) `SELECT COUNT(*) AS total_transactions FROM BLOCKCHAIN
WHERE YEAR(transaction_date) = 2022;`

Section-E

31. Predict the output of following code fragments. For every next code fragment, consider that the changes by previous code fragment are in place. That is, for code fragment (b), changes made by code fragment (a) are persisting; for (c), changes by (a) and (b) are persisting and so on.

5

(a) `import pandas as pd
columns=['2015','2016','2017','2018']
index=['Messi','Ronaldo','Neymar','Hazard']
df=pd.DataFrame(columns=columns,index=index)
print(df)
df.to_csv("c:\\one.csv")`
(b) `df['2015']['Messi']=12
df['2016','Ronaldo']=11
df['2017']['Neymar']=8
df['2018']['Hazard']=16
print(df)
df.to_csv("c:\\two.csv",sep='@')`
(c) `new_df=pd.read_csv("c:\\one.csv",index_col=0)
print(new_df)`
(d) `new_df=pd.read_csv("c:\\one.csv")
print(new_df)`
(e) `new_df=pd.read_csv("c:\\two.csv")
print(new_df)`

Ans: (a)

	2015	2016	2017	2018
Messi	NaN	NaN	NaN	NaN
Ronaldo	NaN	NaN	NaN	NaN
Neymar	NaN	NaN	NaN	NaN
Hazard	NaN	NaN	NaN	NaN

(b)

	2015	2016	2017	2018
Messi	12	NaN	NaN	NaN
Ronaldo	NaN	11	NaN	NaN
Neymar	NaN	NaN	8	NaN
Hazard	NaN	NaN	NaN	16

(c)

	2015	2016	2017	2018
Messi	NaN	NaN	NaN	NaN
Ronaldo	NaN	NaN	NaN	NaN
Neymar	NaN	NaN	NaN	NaN
Hazard	NaN	NaN	NaN	NaN

(d)

	Unnamed: 0	2015	2016	2017	2018
0	Messi	NaN	NaN	NaN	NaN
1	Ronaldo	NaN	NaN	NaN	NaN
2	Neymar	NaN	NaN	NaN	NaN
3	Hazard	NaN	NaN	NaN	NaN

(e)

	@2015@2016@2017@2018
0	Messi@12@@@
1	Ronaldo@@11@@
2	Neymar@@@8@
3	Hazard@@@@16

32. “Anutulya Creations”-A start-up fashion house has set up its main centre at Kanpur, Uttar Pradesh for its dress designing, production and dress supplying activities. It has 4 blocks of buildings. Distance between the various blocks is as follows:

5

A to D 50 m

A to P 60 m

A to S 110m

D to S 60m

P to S 50m

P to D 150m

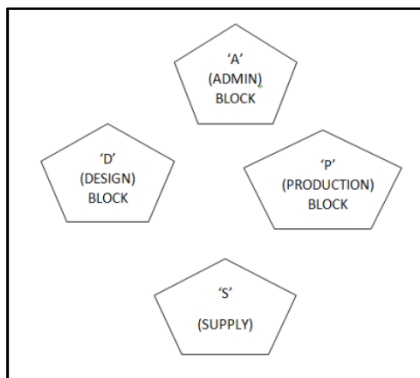
Numbers of computers in each block

Block A - 20

Block D - 80

Block P - 15

Block S - 8



Based on the above specifications, answer the following questions:

(a) Out of LAN, WAN and MAN, what type of network will be formed if we interconnect different computers of the campus? Justify.

(b) Suggest the topology which should be used to efficiently connect various blocks of buildings within Kanpur centre for fast communication.

Also draw the cable layout for the same.

(c) Suggest the placement of the following device with justification

i. Repeater

ii. Hub/Switch

(d) Now a day, video-conferencing software is being used frequently by the company to discuss the product details with the clients. Name any one video conferencing software.

Also mention the protocol which is used internally in video conferencing software.

Ans: (a) LAN (b) Star (c) Repeater – when length exceeds 100 meter , Switch – To expand the network (d) Skype, Teams, Zoom, http

33. The height of 10 students of eighth grade are given below:

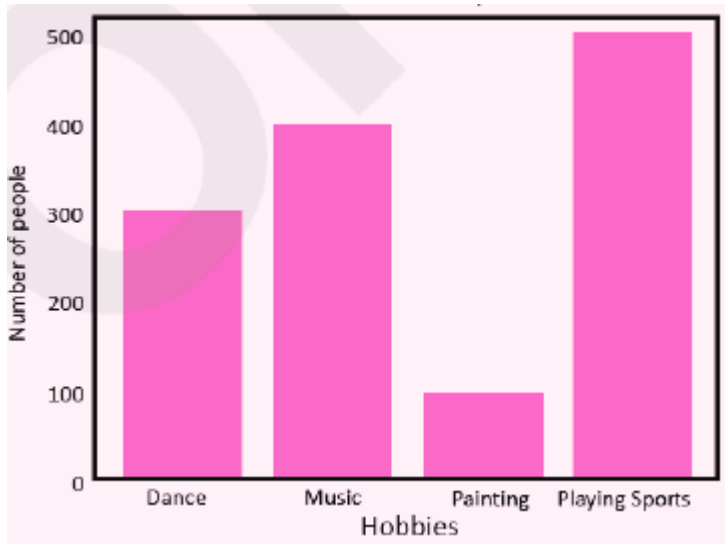
Height_cms=[145,141,142,142,143,144,141,141,143,144]

Write suitable Python code to generate a histogram based on the above data, along with an appropriate 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 show below:



Also give suitable python statement to save this chart.

Ans:

```
import matplotlib.pyplot as plt
# Heights data
height_cms = [145, 141, 142, 142, 143, 144, 141, 141, 143, 144]
# Plotting the histogram
plt.hist(height_cms, bins=10, edgecolor='black') # Adjust the number of bins as needed
# Adding title and labels
plt.title('Height Distribution of 8th Grade Students')
plt.xlabel('Height (cm)')
plt.ylabel('Number of Students')
```

OR

```
import matplotlib.pyplot as plt
hobby=('Dance','Music','Painting','Playing Sports')
users=[300,400,100,500]
plt.bar(hobby,users)
```

```
plt.title("Favourite Hobby")
plt.ylabel("Number of people")
plt.xlabel("Hobbies")
plt.show()
plt.savefig("hobbies.jpg")
```