

Sample Question Paper, 2021-22

(Issued by CBSE Board on 14th January, 2022)

INFORMATICS PRACTICES (Term- II)

SOLVED

Time allowed : 2 Hours

Max. Marks : 40

General Instructions :

1. The question paper is divided into 3 sections – A, B and C
2. Section A, consists of 7 questions (1-7). Each question carries 2 marks.
3. Section B, consists of 3 questions (8-10). Each question carries 3 marks.
4. Section C, consists of 3 questions(11-13). Each question carries 4 marks.
5. Internal choices have been given for question numbers – 1 , 3, 8 and 12.

Section – A

[2 marks each]

1. Aman, a freelance web site developer, has been assigned a task to design few web pages for a book shop. Help Aman in deciding out of static web page and dynamic web page, what kind of web pages should be designed by clearly differentiating between static and dynamic web pages on at least two points.

OR

Priyanka, a beginner in IT field has just started learning web technologies. Help her in understanding the difference between website and web pages with the help of a suitable general example of each.

[2]

2. (i) I :
 - (a) am a small text file
 - (b) created on a user's computer
 - (c) contain small pieces of data — like a username, password and user's browsing history as well as preferences
 - (d) may help to improve user's web browsing experience. Who am I? [1](ii) Name any two popular web browsers. [1]
3. Predict the output of the following queries:
 - (i) Select power(5,3);
 - (ii) Select mod(5,3); [2]

OR

Briefly explain the purpose of the following SQL functions:

- (i) power()
 - (ii) mod()
4. Navya has just created a website for her company and now needs to host it. Briefly discuss the role of a web server in hosting a website.
 5. Help Reshma in predicting the output of the following queries: [2]
 - (i) select round(8.72,3);
 - (ii) select round(9.8);

6. 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. [2]
7. Mr. Som, a HR Manager in a multinational company “Star-X world” has created the following table to store the records of employees:

Table: Emp

Eid	EName	Department	DOB	DOJ
Star1	Ivan	Sales	1994-08-28	2020-02-14
Star2	Melinda	IT	1997-10-15	2021-11-19
Star3	Raj	Accounts	1998-10-02	2019-04-02
Star4	Michael	Sales	2000-02-17	2020-05-01
Star5	Sajal	IT	2001-12-05	2018-06-13
Star6	John	Accounts	1995-01-03	2019-07-15
Star7	Julia	Sales	1985-11-13	2020-08-19

He has written following queries:

- (i) select max(year(DOB)) from emp;
(ii) select ENAME from emp where month(DOJ)=11;

Predict the output.

[2]

OR

Based on the table given above, help Mr. Som writing queries for the following task:

- i) To display the name of eldest employee and his/her date of birth.
ii) To display the name of those employees whose joining month is May.

[2]

Section – B

[3 marks each]

8. Predict the output of the following queries:

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

[3]

OR

Ms.Saumya is working on a MySQL table named 'Hotel' having following structure:

Field	Type	Null	Key	Default	Extra
user_id	varchar(20)	YES		NULL	
name	varchar(20)	YES		NULL	
city	varchar(20)	YES		NULL	
mobile_no	varchar(11)	YES		NULL	

She needs to perform following tasks on the table:

- (i) To fetch last 2 characters from the user_id column.
(ii) To display the values of name column in lower case.
(iii) To display 3 characters from 3rd place from the column city.

Suggest suitable SQL function for the same. Also write the query to achieve the desired task. [3]

9. Reena is working with functions of MySQL. Explain her following:

- (i) What is the purpose of now () function?

- (ii) How many parameters does it accept?
- (iii) What is the general format of its return type? [3]
10. While dealing with string data type in MySQL, it is observed that sometimes unnecessary space character comes in between which hampers the successful execution of a string manipulation module. Name the suitable MySQL function(s) to remove leading, trailing and both type of space characters from a string.
- Also give MySQL queries to depict the same. [3]

Section – C

[4 marks each]

11. Carefully observe the following table named 'stock':

Table: stock

Pid	PName	Category	Qty	Price
1	Keyboard	IO	15	450
2	Mouse	IO	10	350
3	Wifi-router	NW	5	2600
4	Switch	NW	3	3000
5	Monitor	O	10	4500
6	Printer	O	4	17000

Write SQL queries for the following:

- (i) To display the records in decreasing order of price.
- (ii) To display category and category wise total quantities of products.
- (iii) To display the category and its average price.
- (iv) To display category and category wise highest price of the products. [4]
12. Satyam, a database analyst has created the following table:

Table: Student

RegNo	SName	Stream	Optional	Marks
S1001	Akshat	Science	CS	99
S1002	Harshit	Commerce	IP	95
S1003	Devika	Humanities	IP	100
S1004	Manreen	Commerce	IP	98
S1005	Gaurav	Humanities	IP	82
S1006	Saurav	Science	CS	NULL
S1007	Bhaskar	Science	CS	95
S1008	Null	Null	Null	Null

He has written following queries:

- (i) `select sum(MARKS) from student where OPTIONAL= 'IP' and STREAM= 'Commerce';`
- (ii) `select max(MARKS)+min(MARKS) from student where OPTIONAL= 'CS';`
- (iii) `select avg(MARKS) from student where OPTIONAL= 'IP';`
- (iv) `select length(SNAME) from student where MARKS is NULL;`

Help him in predicting the output of the above given queries. [4]

OR

Based on the above given table named 'Student', Satyam has executed following queries:

Select count(*) from student;

Select count(MARKS) from student;

Predict the output of the above given queries.

Also give proper justifications of the output generated through each query. [4]

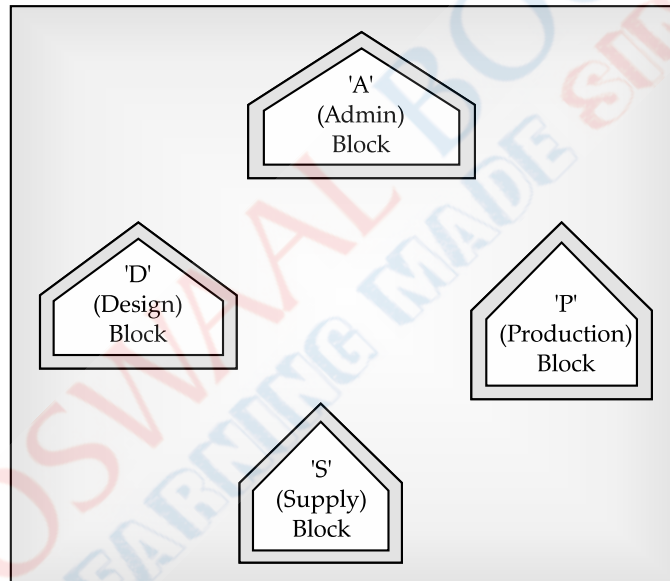
- 13.** "Anutulya Creations"-A start-up fashion house has set up its main centre at Kanpur, Uttar Pradesh for its dress designing, production and dress supplying activities. It has 4 blocks of buildings.

Distance between the various blocks is as follows:

- 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:

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

(iii) Suggest the placement of the following devices with justification

- (a) Repeater
 - (b) Hub/Switch
- (iv) Now a days, 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. [4]

CBSE Marking Scheme 2021-2022

(Issued by Board)

Section – A

1. Difference between static and dynamic web pages:

Static Web page	Dynamic Web page
1. Content of this type of webpage cannot be changed at run time.	1. Content of this type of webpage can be changed at run time.
2. No interaction with server's database is possible in case of static web pages.	2. Interaction with server's database is possible in case of dynamic web pages.

(1 Mark each for each correct differentiation mentioned above or any other relevant point of differentiation)

OR

The difference between a website and a web page is that a website is a collection of different web pages containing information on a particular topic. A web page is an individual page of a big website usually containing more specific information. If we compare a website with a book, then a webpage can be compared with a single page of that book.

(2 Marks for correct answer)

2. (i) Cookies

(1 Mark for correct answer)

(ii) Name of any two popular web browsers:

- Mozilla firefox
- Google Chrome

OR Any other correct name

(½ Mark each for each correct browser name)

3. Output:

(i) 125

(ii) 2

(1 Mark for each correct answer)

OR

(i) power(): It returns the value of a number raised to the power of another number. For example:
Select power(5,3);

Output: 125

(ii) mod(): It returns the remainder of a number divided by another number.

For example:

Select mod(5,3);

Output: 2

(1 Mark for each correct answer)

4. A web server is the main centralized computer system that hosts and runs the websites. It has a computer program that distributes web pages as they are requisitioned. The basic role of the web server is to store, process and deliver the web pages to the users as and when required.

(2 Marks for correct answer)

5. Output:

(i) 8.720

(ii) 10

(1 Mark for each correct answer)

6. Having clause is used to further filter those groups of records which will be generated through group by clause.

For example:

Select max(Marks) from student group by classes having classes in (10,12);

Above given query will arrange records in groups according to the classes. Further filtering on these groups will happen through having clause, which will finally display the highest Marks from classes 10 and 12.

(1 Mark for correct clause)

(1 Mark for correct example)

7. Output:

- (i) 2001
- (ii) Melinda

(1 Mark for each correct answer)

OR

Queries:

- (i) select ENAME,min(DOB) from emp;
- (ii) select ENAME from emp where month(DOJ) = 5;

(1 Mark for each correct answer)

Section – B

[3 Marks each]

8. Output:

- (i) 11
- (ii) cbse
- (iii) exams

(1 Mark for each correct answer)

OR

- (i) right()
select right(user_id,2) from hotel;
- (ii) lower()
select lower(name) from hotel;
- (iii) mid()/substr()/substring()
Select mid(city,3,3) from hotel;

(½ Mark for suggesting each correct function name)

(½ Mark for writing each correct query)

9. (i) It returns the current date and time.
 (ii) None
 (iii) The return type for NOW() function is either in 'YYYY-MM-DD HH:MM:SS' format or YYYYMMDDHHMMSS.uuuuuu format, depending on whether the function is used in a string or numeric context.

(1 Mark for each correct answer)

10. (i) To remove leading space characters: ltrim()
 (ii) To remove trailing space characters: rtrim()
 (iii) To remove both type of space characters: trim()

MySQL Queries:

Select ltrim(' Hello ');

Select rtrim(' Hello ');

Select trim(' Hello ');

Output:

Hello

(½ Mark for suggesting each correct function name)

(½ Mark for writing each correct MySQL query)

Section – C

[4 Marks each]

- 11. (i) select * from stock order by price desc;
- (ii) select category, sum(qty) from stock group by category;
- (iii) select category,avg(price) from stock group by category;
- (iv) select category, max(price) from stock group by category;

(1 Mark for each correct query)

- 12. Output:
 - (i) 193
 - (ii) 194
 - (iii) 93.75
 - (iv) 6

(1 Mark for each correct output)

OR

First query will produce the output 7.

Justification: count (*) will count and display total number of rows (irrespective of any null value present in any of the column).

Second query will produce the output 6. Justification: count (col_name) will count and display total number of not null values in the specified column.

(1 Mark each for each correct output)

(1 Mark each for each correct justification)

- 13. (i) LAN As computers are placed with-in the same campus within a small range.

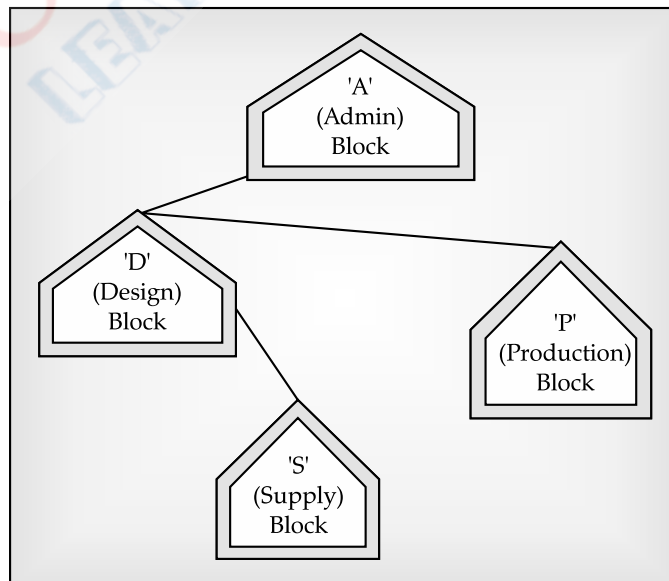
(½ Mark for correct answer)

(½ Mark for correct justification)

- (ii) Star topology

(½ Mark for correct answer)

Cable Layout:



(½ Mark for correct cable layout)

- (i) (a) Repeater should be placed in between Block 'D' (Design) and Block 'P' (Production) as distance is more.
(b) Hub/Switch should be placed in each building to connect various computers together.
($\frac{1}{2}$ Mark for each correct answer)
- (ii) Video Conferencing software: Teams, Zoom, Skype etc. (Any one)
Protocol of Video Conferencing software: VoIP
($\frac{1}{2}$ Mark for each correct answer)



Solved Paper, 2021-22

INFORMATICS PRACTICES

Term-I, Set-4

Series : SSK/3

Question Paper
Code No. 090

Time allowed : 90 Minutes

Max. Marks : 35

General Instructions :

- (i) The paper is divided into 3 Sections – A, B and C.
- (ii) Section – A, consists of Question 1 to 25 and students need to attempt 20 questions.
- (iii) Section - B. consists of Question number 26 to 49 and students need to attempt 20 questions.
- (iv) Section - C, consists of question number 50 to 55 and students need to attempt 5 questions.
- (v) All questions carry equal marks.

SECTION-A

Section A consists of 25 questions, attempt any 20 questions.

1. Which of the following statement is wrong?
 - (a) Can't change the index of the Series.
 - (b) We can easily convert the list, tuple, and dictionary into a series.
 - (c) A Series represents a single column in memory.
 - (d) We can create empty Series.
2. What type of error is returned by the following statement?

```
import pandas as pa
pa.Series ([1, 2, 3, 4], index = ['a', 'b', 'c'])
```

 - (a) Value Error
 - (b) Syntax Error
 - (c) Name Error
 - (d) Logical Error
3. Which is incorrect statement for the python package Numpy?
 - (a) It is a general purpose array-processing package.
 - (b) Numpy arrays are faster and more compact.
 - (c) It is multi-dimensional array.
 - (d) It is proprietary software.
4. The data of any CSV file can be shown in which of the following software?
 - (a) MS Word
 - (b) Notepad
 - (c) Spreadsheets
 - (d) All of the above
5. Which python library is not used for data science?
 - (a) Pandas
 - (b) Numpy
 - (c) Matplotlib
 - (d) Tkinter
6. Which method is used to delete row(s) from DataFrame?
 - (a) .drop() method
 - (b) .del() method
 - (c) .remove() method
 - (d) .delete() method
7. Consider the following code :

```
import numpy as np
import pandas as pd
L=np. array ([10, 20])
x=pd. Series (_____) # Statement 1
print (x)
```

output of the above code is:

```
0 1000
1 8000
dtype: int64
```

What is the correct statement for the above output in the following statement-1?

- (a) `d=L*3` (b) `data=L**3` (c) `L*3` (d) `[10, 20]**3`
8. Which library is imported to draw charts in Python?
 (a) `csv` (b) `matplotlib` (c) `numpy` (d) `pandas`
9. Which of the following would give the same output as `DF/DF1` where `DF` and `DF1` are DataFrames.
 (a) `DF.div(DF1)` (b) `DF1.div(DF)` (c) `Divide(DF,DF1)` (d) `Div(DF,DF1)`
10. Which of the following statement is wrong in context of DataFrame?
 (a) Two dimensional size is Mutable.
 (b) Can perform Arithmetic operations on rows and columns.
 (c) Homogeneous tabular data structure.
 (d) Create Data Frame from numpy ndarray.
11. Which attribute is not used with DataFrame?
 (a) `size` (b) `type` (c) `empty` (d) `columns`
12. With the outset of Covid-19 schools started online classes but due to continuous online classes students health issues also started. Health practitioner advised the parents to follow a few health tips. Which of the following health tips should not be suggested?
 (a) The sitting posture should be correct.
 (b) Breaks should be taken in between the online classes.
 (c) To protect the eyes the gadgets be placed above eye level.
 (d) Wash the eyes regularly.
13. The following is automatically granted to the creator or owner of any invention:
 (a) Patent (b) Copyright (c) Trademark (d) License
14. Himanshi sets up her own company to sell her own range of clothes on instagram. What type of intellectual property can she use to show that the clothes are made by his company?
 (a) Patents (b) Copyright (c) Design (d) Trademark
15. GPL stands for:
 (a) Guided Public License (b) General Public License
 (c) Global Public License (d) General Public Letter
16. E-waste is becoming one of the fastest growing environmental hazards in the world today. If it is not properly treated or disposed of it can cause serious health hazards, therefore, The _____ has issued a formal set of guidelines for proper handing and disposal of e-waste.
 (a) Central Pollution Control Board (CPCB)
 (b) Department of Information Technology (DIT)
 (c) Electrical and Electronic Equipment (WEEE)
 (d) Information Communication Technology (ICT)
17. When we create a DataFrame from a list of Dictionaries, the columns labels are formed by the:
 (a) Union of the keys of the dictionaries
 (b) Intersection of the keys of the dictionaries
 (c) Union of the values of the dictionaries
 (d) Intersection of the values of the dictionaries
18. To change the width of bars in a bar chart, which of the following arguments with a float value is used?
 (a) `hwidth` (b) `width` (c) `breath` (d) `barwidth`
19. Identify the correct option to select first four rows and second to fourth columns from a DataFrame 'Data':
 (a) `display(Data.iloc[1 : 4, 2 : 4])` (b) `display(Data.iloc[1 : 5, 2 : 5])`
 (c) `print(Data.iloc[0 : 4, 1 : 4])` (d) `print(Data.iloc[1 : 4, 2 : 4])`
20. Which of the following commands is used to import matplotlib for coding?
 (a) `import matplotlib.pyplot as plt` (b) `import plt.matplotlib as plt`
 (c) `import py.matplotlib as plt` (d) `import pyplot.matplotlib as plt`

21. Consider the following statements with reference to Line charts:
Statement - A Line graph is a tool for comparison and is created by plotting a series of several points and connecting them with a straight line.
Statement - B You should never use line chart when the chart is in a continuous data set.
- (a) Statement A is correct
 (b) Statement B is correct
 (c) Statement A is correct but Statement B is incorrect
 (d) Statement A is incorrect, but Statement B is correct
22. What is not true about Data Visualization?
 (a) Graphical representation of information and data
 (b) Helps users in analyzing a large amount of data in a simpler way.
 (c) Data Visualization makes complex data more accessible understandable, and usable.
 (d) No library needs to be imported to create charts in Python language.
23. Which attribute is used with Series to count the total number of NAN values.
 (a) size (b) len (c) count (d) count total
24. Consider the following Series in Python:
`data = pd.Series([5, 2, 3, 7], index = ['a', 'b', 'c', 'd'])`
 Which Statement will display all odd values?
 (a) `print(data%2==0)` (b) `print(data[data%2!=0])`
 (c) `print(data mod 2!=0)` (d) `print(data[data%2!=0])`
25. Priya is a student of class 10 and she is a very frequent user of internet applications. One day she got an unpleasant message on her instant messenger. What do you think she should do?
 (a) Start chatting with an unknown person.
 (b) Talk to her parents/teacher or other trusted adult and let them know that she is feeling uncomfortable.
 (c) Ignore the conversation.
 (d) She should delete the chat so that no one comes to know.

SECTION-B

Section B consists of 24 questions (26-49). Attempt any 20 questions.

26. What will be the output of the following code?
`import pandas as pd`
`import numpy`
`s=pd.Series(data=[31, 54, 34, 89, 12, 23], dtype=numpy.int)`
`print (s>50)`

(a)	(b)	(c)	(d)
0 False	1 54	0 31	1 True
1 True	3 89	1 54	3 True
2 False	dtype: int64.	2 34	dtype: bool
3 True		3 89	
4 False		4 12	
5 False		5 23	
dtype: bool		dtype: int64	

27. The primary law in India dealing with cybercrime and electronic commerce is:
 (a) India's Technology (IT) Act, 2008
 (b) India's Digital Information Technology (DIT) Act, 2000
 (c) India's Information Technology (IT) Act, 2000
 (d) The Technology Act, 2008
28. Consider the following statements with reference to Trademark and Hacking
Statement 1 : Trademark is a document that provides legally binding guidelines for the use and distribution of software.
Statement 2 : Hacking is the act of unauthorized access to a computer network or any digital system.
- (a) Statement 1 is True but Statement 2 is False
 (b) Statement 1 is False but Statement 2 is True
 (c) Both the statements are True
 (d) Both the statements are False

29. Consider a following DataFrame:

```
import pandas as pd
s=pd.Series (data=[31, 54, 34, 89, 12, 23])
df=pd.DataFrame (s)
```

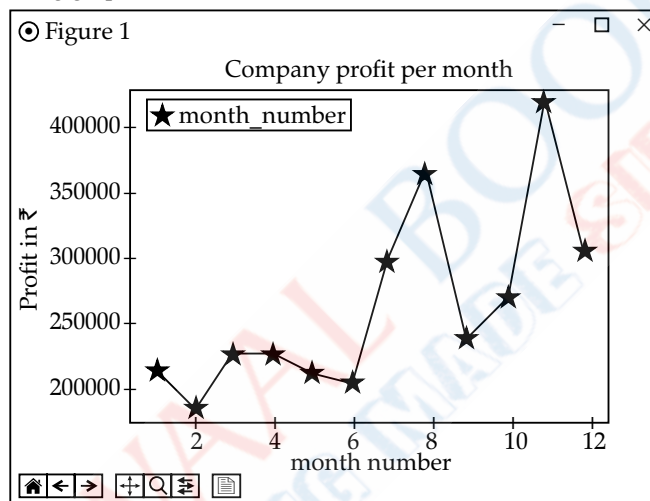
 Which statement will be used to get the output as 2?
 (a) print(df.index) (b) print(df.shape()) (c) print(df.ndim) (d) print(df.value)
30. Sandhya wants to display the last four rows of the dataframe df and she has written the following command:

```
df.tail()
```

 But the first 5 rows are being displayed. To rectify this problem, which of the following statements should be written?
 (a) df.head() (b) df.last(4) (c) df.tail(4) (d) df.rows(4)
31. There is only 1 day left for Ravisha to submit her Science project. Therefore she performed the following activities can be considered as plagiarism?
 (a) Downloaded the images that were marked as CC and pasted in her project file.
 (b) Copied the content from some website and pasted in her file.
 (c) Copied the content from the website and gave reference about the same in the project.
 (d) Downloaded and installed the open source software for typing the synopsis.
32. A contract between the creator and the user to allow the user use his/her work with some price is:
 (a) Agreement (b) Copyright (c) License (d) Patent
33. Consider the following series:

```
ser=pd.Series(['C', 'O', 'M', 'F', 'O', 'R', 'T', 'A', 'B', 'L', 'E']
index= [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11])
print (ser[4 : ])
```
- | | | | |
|--|---|--|---|
| (a)
4 F
5 O
6 R
7 T
8 A
9 B
10 L
11 E
dtype: object | (b)
4 F
5 O
6 R
7 T
8 A
dtype: object | (c)
4 F
5 O
6 R
7 T
8 A
9 B
dtype: object | (d)
5 O
6 R
7 T
8 A
9 B
10 L
11 E
dtype: object |
|--|---|--|---|
34. Nowadays for developing Machine learning projects programmers rely on CSV files rather than databases. Why?
 (a) csv can be used with proprietary software only.
 (b) csv files can be downloaded from open source websites free of cost.
 (c) csv files need not be imported while creating the projects.
 (d) csv is a simple and well formatted mode for data storage.
35. Companies get their Trademark registered to project?
 (a) logos, names and brands
 (b) word, phrase, or symbol
 (c) slogans, stylized fonts, and colors.
 (d) company furniture, worker, brands
36. DataFrames can be created from:
 (a) lists (b) dictionaries (c) series (d) all of the above
37. Rohit forgot his laptop in his car and when he came back he found his laptop was missing. This act is:
 (a) Cyber crime (b) Phishing (c) Theft (d) Plagiarism
38. Consider the following statements
Statement A: .loc() is a label based data selecting method to select a specific row(s) or column(s) which we want to select.
Statement B: .iloc() can not be used default indices if customized indices are provided.
 (a) Statement A is True but Statement B is False
 (b) Statement A is False but Statement B is True

- (c) Statement A and Statement B both are False
 (d) Statement A and Statement B both are True
39. Abhay is a student of class 'XII', and he is aware of some concepts of python. He has created the DataFrame, but he is getting errors after executing the code. Help him by identifying the correct statement that will create the DataFrame: Code:
- ```
import pandas as pd
stuname=['Muskan', 'Radhika', 'Gopar', 'pihu']
term1=[70, 63, 74, 90]
term2=[67, 70, 86, 95]
```
- (a) `df=pd.DataFrame({"Name":stuname,"marks1":term1,"marks2":term2})`  
 (b) `df=pd.dataframe([stuname,term1,term2],columns=['stuName',"marks1","marks2"])`  
 (c) `df=pd.DataFrame({stuname,term1,term2})`  
 (d) `df=pd.dataframe({stuname,term1.term2})`
40. Ms. Kalpana is working with an IT company, and she wants to create charts from the data provided to her. She generates the following graph:



- Which statement is used to mark the line as given in the above fig :
- (a) `plt.plot(x,y,marker='#',markersize=10,color='red',linestyle='dashdot')`  
 (b) `plt.plot(x,y,marker='star',markersize=10,color='red')`  
 (c) `plt.plot(x,y,marker='@',markersize=10,color='red',linestyle='dashdot')`  
 (d) `plt.plot(x,y,marker='*',markersize=10,color='red')`
41. Mr. Raman created a DataFrame from a Numpy array :
- ```
arr = np.array ([[2, 4, 8, ], [3, 9, 27], [4, 16, 64]])
df=pd.DataFrame (arr,index = ['one','two','three'],_____)
```
- print(df)

Help him to add a customized column labels to the above DataFrame

- (a) `columns='no','sq','cube'`
 (b) `column=['no','sq','cube']`
 (c) `columns=['no','sq','cube']`
 (d) `columns=[['no', 'sq', 'cube']]`
42. What will be the output of the following program?
- ```
import pandas as pd
dic={'Name': ['Sapna', 'Anmol', 'Rishul', 'Sameep'],
'Agg': [56, 67, 75, 76], 'Age': [16, 18, 16, 19]}
df=pd. DataFrame (dic,columns=['Name','Age'])
print(df)
```

| (a) | Name   | Agg | Age |
|-----|--------|-----|-----|
| 101 | Sapna  | 56  | 16  |
| 102 | Anmol  | 67  | 18  |
| 103 | Rishul | 75  | 16  |
| 104 | Sameep | 76  | 19  |

| (C) | Name   |
|-----|--------|
| 0   | Sapna  |
| 1   | Anmol  |
| 2   | Rishul |
| 3   | Sameep |

| (b) | Name   | Agg | Age |
|-----|--------|-----|-----|
| 0   | Sapna  | 56  | 16  |
| 1   | Anmol  | 67  | 18  |
| 2   | Rishul | 75  | 16  |
| 3   | Sameep | 76  | 19  |

| (d) | Name   | Age |
|-----|--------|-----|
| 0   | Sapna  | 16  |
| 1   | Anmol  | 18  |
| 2   | Rishul | 16  |
| 3   | Sameep | 19  |

43. Consider the following code

```
import pandas as pd
S1=pd.Series([23, 24, 35, 56], index=['a', 'b', 'c', 'd'])
S2=pd.Series([27, 12, 14, 15],
index=['b', 'y', 'c', 'ab'])
df=pd.DataFrame (S1+S2)
print (df)
```

Output for the above code will be :

| (a) | O    |
|-----|------|
| a   | NaN  |
| ab  | NaN  |
| b   | 51.0 |
| c   | 49.0 |
| d   | NaN  |
| y   | NaN  |

| (c) | O  |
|-----|----|
| b   | 50 |
| y   | 36 |
| c   | 49 |
| ab  | 71 |

| (b) | O  |
|-----|----|
| a   | 50 |
| b   | 36 |
| c   | 49 |
| d   | 71 |

| (d) | O   |
|-----|-----|
| a   | NaN |
| ab  | NaN |
| b   | NaN |
| c   | NaN |
| d   | NaN |
| y   | NaN |

44. Sudhanshu has written the following code to create a DataFrame with boolean index :

```
import numpy as np
import pandas as pd
df=pd.DataFrame (data=[[5, 6, 7]], index= [true, false, True])
print (df)
```

While executing the code, she is getting an error, help her to rectify the code:

- (a) `df=pd.DataFrame([True,False,True],data=[5, 6, 7])`
- (b) `df=pd.DataFrame(data=[5, 6, 7],index=[True,False,True])`
- (c) `df=pd.DataFrame([True,false,true],data=[5, 6, 7])`
- (d) `df=pd.DataFrame(index=[true,false,true],data=[[5, 6, 7]])`

45. The rights of the owner of information to decide how much information is to be shared/exchanged/distributed, are collectively known as \_\_\_\_\_.

- (a) Intelligent Protatable Rights
- (b) Intellectual Property Rights
- (c) Interactive Property Rights
- (d) Instance Portability Rights

46. Abhilasha forgot to sign out from her gmail id and Aditi used Abhilasha's gmail to sent mail. This act of Aditi is considered as:

- (a) Plagiarim
- (b) Identity Theft
- (c) Phishing
- (d) Piracy

47. The trail that is automatically created when a person uses the internet on any digital devices like Laptops, smart phones, tablets, etc is called \_\_\_\_\_.

- (a) Cyberbullying
- (b) Phishing
- (c) Digital Footprint
- (d) Digital Activity



48. \_\_\_\_\_ operating system comes under FOSS.  
 (a) Windows (b) Ubuntu (c) Mac (d) Oracle

49. Sushila has created a DataFrame with the help of the following code:

```
import pandas
EMP={'EMPID': ['E01', 'E02', 'E03', 'E04', 'E05'],
 'EMPNAME': ['KISHORI', 'PRIYA', 'DAMODAR', 'REEMA', 'MANOJ'],
 'EMP_SALARY': [67000, 34000, 68000, 90000, 43000]
 }
```

```
df=pandas.DataFrame(EMP,index=['001', '002', '003', '004', '005'])
print(df.loc[0:3:])
```

and she wants to get the following output

```
EMPID EMPNAME EMP_SALARY
001 E01 KISHORI 67000
002 E02 PRIYA 34000
003 E03 DAMODAR 63000
```

help her to correct the code

- (a) print(df.iloc['001', '003',:]) (b) print(df.loc['001': '003', :])  
 (c) print(EMP[loc[0:3,:]]) (d) print(df.loc['001', '004',:])

### SECTION-C

Section C consists of 6 questions (50-55). Attempt any 5 questions

#### Case Study

Ms Ramdeep Kaur maintains the records of all students of her class. She wants to perform some operations on the data:

Code:

```
import pandas as pd
t= {'Rollno': [101, 102, 103, 104, 105, 106, 107],
 'Name': ['Shubrato', 'Krishna', 'Pranshu', 'Gurpreet', 'Arpit', 'Sanidhya', 'Aurobindo'],
 'Age': [15, 14, 14, 15, 16, 15, 16],
 'Marks': [77.9, 70.4, 60.9, 80.3, 86.5, 67.7, 85.0],
 'Grade': ['11B', '11A', '11B', '11C', '11E', '11A', '11C',]}
df = pd.DataFrame(t,index=[10, 20, 30, 40, 50, 60, 70])
print(df)
```

Output of the above code:

|    | Rollno | Name      | Age | Marks | Grade |
|----|--------|-----------|-----|-------|-------|
| 10 | 101    | Shubrato  | 15  | 77.9  | 11B   |
| 20 | 102    | Krishna   | 14  | 70.4  | 11A   |
| 30 | 103    | Pranshu   | 14  | 60.9  | 11B   |
| 40 | 104    | Gurpreet  | 15  | 80.3  | 11C   |
| 50 | 105    | Arpit     | 16  | 86.5  | 11E   |
| 60 | 106    | Sanidhya  | 15  | 67.7  | 11A   |
| 70 | 107    | Aurobindo | 16  | 85.0  | 11C   |

Based on the given information, answer questions No. 50-55.

50. Select the correct statement for the below output:

```
Name Krishna
Age 14
Marks 70.4
Grade 11A
Name : 20 dtype: object
```

- (a) print(df.iloc[2]) (b) print(df.loc[2]) (c) print(df.iloc[20]) (d) print(df.loc[20])



51. The teacher wants to know the marks secured by the second last student only, Which statement would help her to get the correct answer?  
 (a) `print(df.loc[60:70,'Marks'])` (b) `print(df.loc[60:60,'Marks'])`  
 (c) `print(df.iloc[-2:-2],['Marks'])` (d) `print(df.[-2:-2]'Marks')`
52. Which of the following statement(s) will add a new column 'fee' at second position with values [3200, 3400,4500,3100,3200,4000,3700] in Data frame df?  
 (a) `df.insert(loc=2,column='fee',value=[3200, 3400, 4500, 3100, 3200, 4000, 3700])`  
 (b) `df.add(2,colmn='fee',[3200, 3400, 4500, 3100, 3200, 4000, 3700])`  
 (c) `df.append(loc=2,'fee'=[3200, 3400, 4500, 3100, 3200, 4000, 3700])`  
 (d) `df.insert(loc=2,'fee',[3200, 3400, 4500, 3100, 3200, 4000, 3700])`
53. Which of the following commands is used to delete the column 'Grade' in the DataFrame df?  
 (a) `df.drop('Grade',axis=1,inplace=True)`  
 (b) `df.drop('Grade',axis=0,inplace=True)`  
 (c) `df.drop('Grade',axis=1,inplace=True)`  
 (d) `df.delete('Grade',axis=1,inplace=True)`
54. Which of the following commands would rename the column 'Marks' to 'Halfyearly' in the DataFrame df?  
 (a) `df.rename(['Marks','Halfyearly'], inplace=True)`  
 (b) `df.rename({'Makrs', 'Halfyearly'},inplace=True)`  
 (c) `df.rename(columns={'Makrs':'Halfyearly'},inplace=True)`  
 (d) `df.rename(['Marks':'Halfyearly'],inplace=True)`
55. Which of the following commands will display the Names and Marks of all students getting more than 80 marks?  
 (a) `print(df.loc['Makrs '>80,['Name', 'Marks']])`  
 (b) `print(df.loc[df['Marks']<80,'Name', 'Marks'])`  
 (c) `print(df.loc[df['Marks']<80, ['Name', 'Marks']])`  
 (d) `print(df.loc[df['Marks']>80,['Name', 'Marks']])`

□□□

## ANSWERS

### SECTION-A

1. (a) Can't change the index of the Series.

*Explanation:* Index of a Series can be changed using `reset_index()`.

2. (a) Value Error

*Explanation:*

*Explanation:* Length of passed value and index do not match.

3. (d) It is proprietary software.

*Explanation:* It is an open source software.

4. (d) All of the above

*Explanation:* Since it is a simple text file it can be viewed in notepad, word processor or a spreadsheet software.

5. (d) Tkinter

*Explanation:* Tkinter is used to create GUI applications with Python.

6. (a) `.drop()` method

*Explanation:* `.drop()` is used to delete row(s) in a dataframe. To delete row(s) index labels are used and to delete columns column labels are used.

7. (b) `data=L**3`

*Explanation:* `L=np.array([10,20])` will create a numpy array with elements 10 and 20. Now a series is created using `pd.Series(L**3)` will create a series whose each element will be cube of the elements of array L.

8. (b) matplotlib

*Explanation:* csv is a file type, Numpy is Python library for arrays, Pandas is data structure package, and Matplotlib is used to draw charts.

9. (a) DF.div(DF1)

*Explanation:* The syntax for div() is  
Dataframe.div([scalar/series/sequence or dataframe], axis, fill\_value),  
this function returns the result of dataframe divided by a scalar, sequence, series or another dataframe. Hence, to get same output as DF/DF1 we use DF.div(DF1).

10. (c) Homogeneous tabular data structure.

*Explanation:* Dataframes are heterogeneous tabular structure as they contain data of different types.

11. (b) type

*Explanation:* Attributes used with a dataframe are index, columns, axes, dtypes, size, shape, values, empty, ndim.

12. (c) To protect the eyes the gadgets be placed above eye level.

*Explanation:* Any screen or book should be placed at eye level for comfortable viewing and reading.

13. (b) Copyright

*Explanation:* One has to apply for a patent, trademark and license.

14. (d) Trademark

*Explanation:* A trademark is a special symbol that exclusively marks one's products.

15. (b) General Public License

*Explanation:* It is the most commonly used licence for open-source projects.

16. (a) Central Pollution Control Board (CPCB)

*Explanation:* CPCB is responsible for the control and monitoring of air and water quality in India.

17. (a) Union of the keys of the dictionaries

*Explanation:* All the keys of the dictionaries form the columns of the dataframe.

18. (b) width

*Explanation:* To specify common width for all bars width argument having a scalar float value in the bar() function as:  
<matplotlib.pyplot>.bar(<x-sequence>,<y-sequence>, width=<float value>)

19. (c) print(Data.iloc[0 : 4, 1 : 4])

*Explanation:* The syntax for iloc is :  
dataframe.iloc[<start row index>:<end row index>,<start column index>:<end column index>]  
here start and end index for rows and columns act as slicing and the end index is excluded. So, for first 4 rows indexes will be 0:4 and second to fourth columns it will be 1:4.

20. (a) import matplotlib.pyplot as plt

*Explanation:* To import matplotlib one of the following forms can be used:  
import matplotlib.pyplot  
import matplotlib.pyplot as pl

21. (c) Statement A is correct but Statement B is incorrect

*Explanation:* A line chart displays information as a series of data points connected by straight line segments. They make sense for continuous sets of data.

22. (d) No library needs to be imported to create charts in Python language.

*Explanation:* To create charts in Python we need to import matplotlib library.

23. (a) Size

*Explanation:* size returns the total number of elements.  
len returns the length of each element in the series  
count() counts the number of non-NAN Values.

24. (d) print(data[data%2!=0])

*Explanation:* print(data) will print the complete series. print(data[data%2!=0]) will print those elements from the series which are odd.

25. (b) talk to her parents/teacher or other trusted adult and let them know that she is feeling uncomfortable.

*Explanation:* we should never talk to unknown person over the internet. Ignoring any cyber bully will provoke him to do more such things, deleting the chat will be no solution as that person may again send similar messages. The best way is to tell her parents / teacher or some other trusted adults so that they can help her.

### SECTION-B

26. (a) 0 False

1 True

2 False

3 True

4 False

5 False

dtype: bool

*Explanation:* s>50 will iterate over each element of the series and check if the condition is true.

27. (c) India's Information Technology (IT) Act, 2000

*Explanation:* It is an act of the Indian Parliament notified on 17 october 2000.

28. (b) Statement 1 is False but Statement 2 is True

*Explanation:* license is the document that provides legally binding guidelines for use and distribution of a software. So, statement 1 is false but 2 is true.

29. (c) print(df.ndim)

*Explanation:* df.index will give the index of the dataframe ie. 0,1,2,3,4,5.  
df.shape will return a tuple representing the dimensionality of the dataframe.  
df.values will return a Numpy representation of the dataframe.  
df.ndim returns an int representing the number of axes/ array dimensions.

30. (c) df.tail(4)

*Explanation:* The tail function returns last n rows from a dataframe. The default value of n is 5. As Sandhya has not specified any value for n so by default last 5 rows are being displayed.

31. (b) Copied the content from some website and posted in her file.

*Explanation:* images downloaded and pasted without citation is a form of plagiarism.

32. (c) License

*Explanation:* A license allows a person to use some other's copyright work.

33. (d) 5 O

6 R

7 T

8 A

9 B

10 L

11 E

dtype: object

**Explanation:** Slicing takes index numbering from 0, not from the index provided.

34. (d) csv is a simple and well formatted mode for data storage.

**Explanation:** CSV files can be easily used to move data between programs that ordinarily can't exchange data.

35. (b) word, phrase, or symbol

**Explanation:** A trademark can be any word, symbol or phrase that recognizes a particular company.

36. (d) all of the above

**Explanation:** To create a dataframe a 2D data structure is passed to DataFrame () constructor. This 2D data structure can be a list, series or a dictionary.

37. (c) Theft

**Explanation:** Cyber crime, Phishing and plagiarism are all done using digital equipments and internet. This is a clear case of theft as a physical object has been picked from a real location.

38. (a) Statement A is True but Statement B is False

**Explanation:** iloc() is strictly used with default indexing and loc() with labels so statement A is true but statement B is false.

39. (a) `df=pd.DataFrame({"Name":stuname,"marks1":term1,"marks2":term2})`

**Explanation:** Dataframe can be created in multiple ways. We can use the lists, dictionary and from a list of dictionary etc., in option (B) and (C) Dataframe is in lower case as D and F should be in upper case, So option a is correct.

40. (d) `plt.plot(x,y,marker='*',markersize=10,color='red')`

**Explanation:** To show star as marker, marker = '\*' is used so option d is correct.

41. (c) `columns=['no','sq','cube']`

**Explanation:** The syntax to create a dataframe is `<dataframe object>= panda.DataFrame(<a 2D structure>,[columns=<column sequence>],[index=<index sequence>])`. here column names are to be provided as a sequence along with the columns argument. So we will provide here columns as a list.

42. (d)
- |   | Name   | Age |
|---|--------|-----|
| 0 | Sapna  | 16  |
| 1 | Anmol  | 18  |
| 2 | Rishul | 16  |
| 3 | Sameep | 19  |

**Explanation:** Here only those keys of the dictionary whose name is specified in columns parameter will form the dataframe. i.e., Name and Age.

43. (a)
- |        |
|--------|
| O      |
| a NaN  |
| ab NaN |
| b 51.0 |
| c 49.0 |
| d NaN  |
| y NaN  |

**Explanation:** Values of only those indexes will be added which exist in both the series. For other indexes result will be NAN. The result set will now form the new dataframe.

44. (b) `df=pd.DataFrame(data=[5, 6, 7],index=[True,False,True])`

**Explanation:** The syntax to create a dataframe is `<dataframe object>= panda.DataFrame(<a 2D structure>,[columns=<column sequence>],[index=<index sequence>])`.index parameter is provided after the 2D structure and boolean true and false are written as True and False respectively.

45. (b) Intellectual Property Rights

*Explanation:* Information makes intellectual property, to decide how much information to share and at what price are the rights of the owner.

46. (b) Identity Theft

*Explanation:* Identity theft refers to act as someone else to send some information/message or for some odd financial or personal gains.

47. (c) Digital Footprint

*Explanation:* Digital footprints are the marks of one's digital activity.

48. (b) Ubuntu

*Explanation:* FOSS or free and open source software are those softwares that are free as well as open source.

49. (b) `print(df.loc['001', '003', :])`

*Explanation:* `iloc` is used with index number. `loc` is used with index and column labels. the syntax for `loc` is  
`<dataframe object>.loc[<startrow>:<endrow>,<start column>:<end column>]`  
 to access a particular row its name or label is to be specified.

### SECTION-C

50. (d) `print(df.loc[20])`

*Explanation:* `iloc` is used with index number which is 1 for the given record. To access the record of Krishna its label 20 is used with `loc` method. the syntax for `loc` is  
`<dataframe object>.loc[<startrow>:<endrow>,<start column>:<end column>]`

51. (b) `print(df.loc[60:60,'Marks'])`

*Explanation:* The syntax for `loc` is  
`<dataframe object>.loc[<startrow>:<endrow>,<start column>:<end column>]`  
 to get the record of second last student its label 60 is used and to get the marks column only name of this column i.e marks will be used. Since negative indexing is not possible in Pandas so c and d can not be the answers.

52. (a) `df.insert(loc=2,column='fee',value=[3200, 3400, 4500, 3100, 3200, 4000, 3700])`

*Explanation:* `insert(loc, column, values)` is the function used to insert a column in an existing dataframe. Here `loc` is the position where the column is to be added and `column` is the column label and `values` is the list of values to be added.

53. (a) `df.drop('Grade',axis=1,inplace=True)`

*Explanation:* the `<dataframeobject>.drop([<columnname>],axis,inplace=True/false)` function is used to delete a table column by name. `axis = 1` specifies deleting a column and not a row, `inplace=True` will make the function operate upon the original dataframe.

54. (c) `df.rename(columns={'Maksr':'Halfyearly'},inplace=True)`

*Explanation:* The syntax for rename function is `< data frame object >. rename (column = {old column name : newcolumn name}, inplace = true)`

55. (d) `print(df.loc[df['Marks']>80,['Name', 'Marks']])`

*Explanation:* `df['Marks'] > 80` will select all the rows where marks are more than 80 . Using this with `loc` will locate such records and `['Name','Marks']` will print name and marks column of all such rows.



# Term – I

## OMR SHEET

Booklet Series

# A

Use English Numbers / Letters only. Use Blue / Black Ball Point Pen to write in box.

|                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                         |                                                                                                                                |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Booklet Series<br><input type="text"/><br>(A)<br>(B)<br>(C)<br>(D) | Roll Number<br><input type="text"/><br>(0) (0) (0) (0) (0) (0) (0) (0)<br>(1) (1) (1) (1) (1) (1) (1) (1)<br>(2) (2) (2) (2) (2) (2) (2) (2)<br>(3) (3) (3) (3) (3) (3) (3) (3)<br>(4) (4) (4) (4) (4) (4) (4) (4)<br>(5) (5) (5) (5) (5) (5) (5) (5)<br>(6) (6) (6) (6) (6) (6) (6) (6)<br>(7) (7) (7) (7) (7) (7) (7) (7)<br>(8) (8) (8) (8) (8) (8) (8) (8)<br>(9) (9) (9) (9) (9) (9) (9) (9) | Name <input type="text"/><br><input type="text"/><br>Test Date <input type="text"/><br>Student's Signature <input type="text"/><br>Invigilator's Signature <input type="text"/><br>Certified that all the entries in this section have been properly filled by the student | Proper Marking<br>The OMR Sheet will be computer checked. Fill the circles completely and dark enough for proper detection. Use ballpen (black or blue) for marking.<br>(A) (B) (C) (D)<br>Avoid Improper Marking<br>Partially Filled<br>Lightly Filled | Test Center Code<br>(0) (0)<br>(1) (1)<br>(2) (2)<br>(3) (3)<br>(4) (4)<br>(5) (5)<br>(6) (6)<br>(7) (7)<br>(8) (8)<br>(9) (9) |
| Subject<br><input type="text"/>                                    |                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                         |                                                                                                                                |

### IMPORTANT

The candidate should check that the Test Book Series printed on the OMR Sheet is the same as printed on the Test Booklet. In case of discrepancy, the candidate should immediately report the matter to the invigilator for replacement of both the Test Booklet and the Answer Sheet.

**Darken the circle for each question.**

| Q.No. | Response        | Q.No. | Response        | Q.No. | Response        | Q.No. | Response        |
|-------|-----------------|-------|-----------------|-------|-----------------|-------|-----------------|
| 01    | (A) (B) (C) (D) | 16    | (A) (B) (C) (D) | 31    | (A) (B) (C) (D) | 46    | (A) (B) (C) (D) |
| 02    | (A) (B) (C) (D) | 17    | (A) (B) (C) (D) | 32    | (A) (B) (C) (D) | 47    | (A) (B) (C) (D) |
| 03    | (A) (B) (C) (D) | 18    | (A) (B) (C) (D) | 33    | (A) (B) (C) (D) | 48    | (A) (B) (C) (D) |
| 04    | (A) (B) (C) (D) | 19    | (A) (B) (C) (D) | 34    | (A) (B) (C) (D) | 49    | (A) (B) (C) (D) |
| 05    | (A) (B) (C) (D) | 20    | (A) (B) (C) (D) | 35    | (A) (B) (C) (D) | 50    | (A) (B) (C) (D) |
| 06    | (A) (B) (C) (D) | 21    | (A) (B) (C) (D) | 36    | (A) (B) (C) (D) | 51    | (A) (B) (C) (D) |
| 07    | (A) (B) (C) (D) | 22    | (A) (B) (C) (D) | 37    | (A) (B) (C) (D) | 52    | (A) (B) (C) (D) |
| 08    | (A) (B) (C) (D) | 23    | (A) (B) (C) (D) | 38    | (A) (B) (C) (D) | 53    | (A) (B) (C) (D) |
| 09    | (A) (B) (C) (D) | 24    | (A) (B) (C) (D) | 39    | (A) (B) (C) (D) | 54    | (A) (B) (C) (D) |
| 10    | (A) (B) (C) (D) | 25    | (A) (B) (C) (D) | 40    | (A) (B) (C) (D) | 55    | (A) (B) (C) (D) |
| 11    | (A) (B) (C) (D) | 26    | (A) (B) (C) (D) | 41    | (A) (B) (C) (D) | 56    | (A) (B) (C) (D) |
| 12    | (A) (B) (C) (D) | 27    | (A) (B) (C) (D) | 42    | (A) (B) (C) (D) | 57    | (A) (B) (C) (D) |
| 13    | (A) (B) (C) (D) | 28    | (A) (B) (C) (D) | 43    | (A) (B) (C) (D) | 58    | (A) (B) (C) (D) |
| 14    | (A) (B) (C) (D) | 29    | (A) (B) (C) (D) | 44    | (A) (B) (C) (D) | 59    | (A) (B) (C) (D) |
| 15    | (A) (B) (C) (D) | 30    | (A) (B) (C) (D) | 45    | (A) (B) (C) (D) | 60    | (A) (B) (C) (D) |