Class XII (2023-24)
Sample Paper
Subject - Informatics Practices

Max Marks : 70 **Time Allowed: 3 Hours**

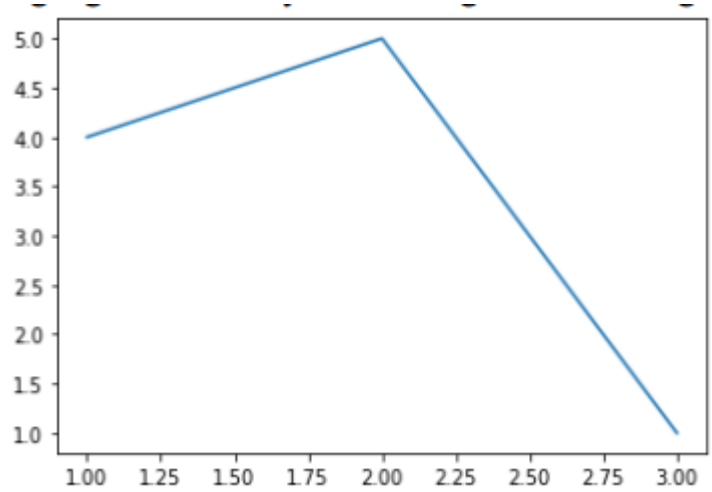
Instructions :

- Programming language - Python
- There are four sections:
  (i) Section A contains MCQ (Question 1 -21) and 1 mark each.
  (ii) Section B contains 10 questions of 2 marks each. (Question 22-30)
  (iii) Section C contains 7 questions of 3 marks each. (Questions 31-37)
  (iv) Section D contains 2 questions of 4 marks each. (Questions 38-39)

	Section - A (Multiple Choice Questions) **Select the most appropriate option out of the options given for each question. Attempt all questions.**	
1.	Find the output of the following program. import numpy as np d=np.array([10,20,30,40,50,60,70]) print(d[-4:])	1
2.	Consider a declaration L = [1, 'Python', '3.14']. Which of the following represents the data type of L? a. List b. Tuple c. dictionary d. string	1
3.	Fill in the blank with an appropriate numpy method to create an array. import numpy as np data=np._____([1,2,3,4,5,6])	1
4.	Which of the following options is not correct? a. The mul() function is used to perform multiplication operations on series. b. The parameter fill_value can be used to fill the specified value instead of NaN value for any elements in series that might be missing. c.Series cannot be created without using numpy module d. The head function is used to return a specified number of rows from the beginning of a Series.	1
5.	_____ method in Pandas can be used to change the index of rows and columns of a Series or Dataframe : (i) rename() (ii) reindex() (iii) reframe() (iv) none of the above	1
6.	Hitesh wants to display the last four rows of the data frame df and has written the following code : df.tail()	1

	But the last 5 rows are being displayed. Identify the error and rewrite the correct code so that the last 4 rows get displayed.	
7.	The name “Pandas” is derived from the term: a. Panel Data b. Panel Series c. Python Document d. Panel Data Frame	1
8.	The command to install the pandas is: a. install pip pandas b. install pandas c. pip pandas d. pip install pandas	1
9.	Python pandas was developed by: a. Guido van Rossum b. Travis Oliphant c. Wes McKinney d. Brendan Eich	1
10.	Pandas is a: a. Package b. Language c. Library d. Software	1
11.	Method or function to add a new row in a data frame is: a. .loc() b. .iloc() c. join d. add()	1
12.	Out of the following, which function cannot be used for customization of charts in Python? a. xlabel() b. colour() c. title() d. xticks()	1
13.	_____ is the function to save the graph. a. Savefig() b. Savefigure() c. Savegraph() d. Savechart()	1
14.	Pandas data frame cannot be created using: a. Dictionary of tuples b. Series c. Dictionary of List d. List of Dictionaries	1
15.	Which function will be used to read data from a CSV file into a pandas data frame? a. readcsv() b. to_csv() c. read_csv() d. csv_read()	1
16.	What is the full form of Modem? a. Modular Device b. Multiple Device c. Modulator Demodulator d. Multiple Dissemination	1
17.	Write a small python code to create a dataframe with headings(a and b) from the list given below : [[1,2],[3,4],[5,6],[7,8]]	1
18.	Which of the following characters acts as default delimiter in a csv file? a. (colon) : b. (hyphen) - c. (comma) , d. (vertical line) |	1

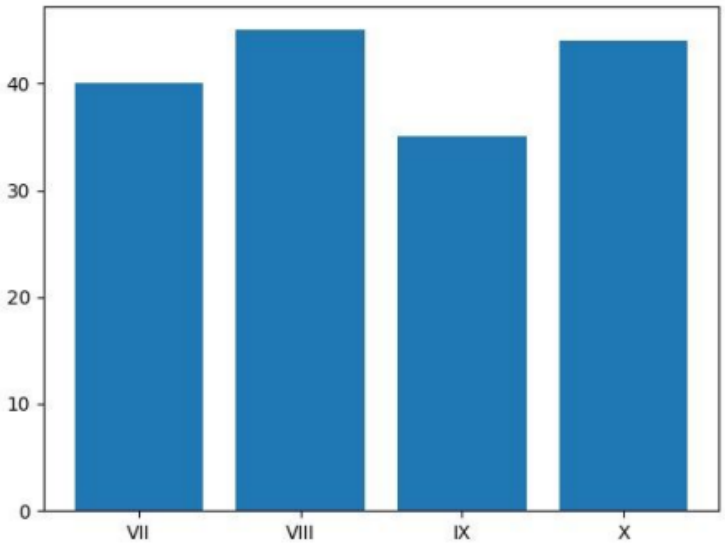
19.	Write a small python code to drop a row from dataframe 'df_marks' labeled as 0.	1
20.	Which of these about a dictionary is false? a) The values of a dictionary can be accessed using keys b) The keys of a dictionary can be accessed using values c) Dictionaries aren't ordered d) Dictionaries are mutable	1
21.	Consider the following dataframe : student_df Name class marks Anamay XI 95 Aditi XI 82 Mehak XI 65 Kriti XI 45 Write a statement to get the minimum value of the column marks.	1
	Section - II	
22.	Write the output of the following code : import numpy as np array1=np.array([10,12,14,16,18,20,22]) print(array1[1:5:2])	2
23.	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: 	2
24.	What are Add-Ons? Name any two plugins.	2
25.	Differentiate between Domain name and URL along with example.	2
26.	A social science teacher wants to use a pandas series to teach about Indian historical monuments and its states. The series should have the	2

	monument names as values and state names as indexes which are stored in the given lists, as shown in the code. import pandas as pd Monument=['Qutub Minar','Gateway of India','Red Fort','Taj Mahal'] State=['Delhi','Maharashtra','Delhi','Uttar Pradesh'] a. Write a statement to create the series. b. Write a statement to sort the series in descending order.	
27.	**Observe the following figure. Identify the coding for obtaining this as output:** 	2
28.	Consider the following series named animal: Write the output of the command: L Lion B Bear E Elephant T Tiger W Wolf dtype: object print(animal[::-3])	2
29.	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.	2
30.	Write the output of the given program: import pandas as pd	2

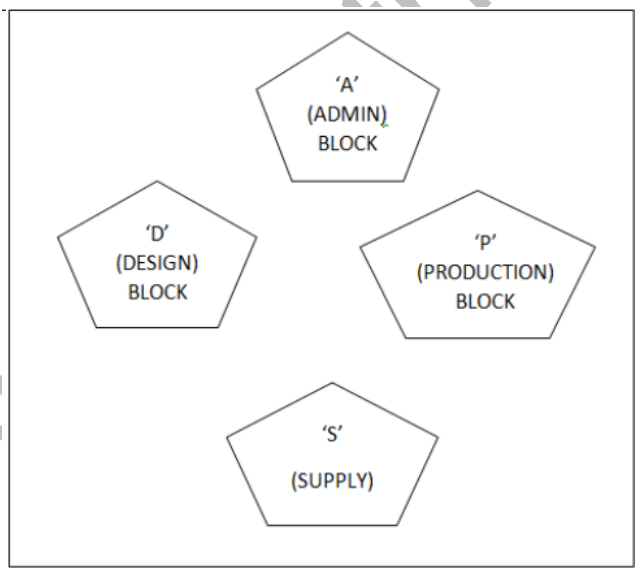
	S1=pd.Series([5,6,7,8,10],index=['v','w','x','y','z']) l=[2,6,1,4,6] S2=pd.Series(l,index=['z','y','a','w','v']) print(S1-S2)	
	Section - II	
31.	Given a data frame df1 as shown below: **City** **Maxtemp** **MinTemp** **RainFall** Delhi 40 32 24.1 Bengaluru 31 25 36.2 Chennai 35 27 40.8 Mumbai 29 21 35.2 Kolkata 39 23 41.8 (i) Write a command to compute the sum of every column of the data frame. (ii) Write a command to compute the mean of column Rainfall. (iii) Write a command to compute the Median of the Maxtemp Column.	3

32.	Find the output of the following code:
	
	import pandas as pd
	data = [{'a': 10, 'b': 20},{'a': 6, 'b': 32, 'c': 22}]
	#with two column indices, values same as dictionary keys
	df1 = pd.DataFrame(data, index=['first', 'second'], columns=['a', 'b'])
	#With two column indices with one index with other name
	df2 = pd.DataFrame(data, index=['first', 'second'], columns=['a', 'b1'])
	print(df1)
	print(df2)
		3

33.	Explain the purpose of following devices: 1) MODEM 2) Repeater 3) Gateway	3
34.	Mr. Sharma is working with an IT company, and he has provided some data. On which he wants to do some operations, but he is facing some problem, help him: Code: import pandas as pd ResultSheet={ 'Naveen': pd.Series([90, 91, 97], index=['Maths','Science','Hindi']), 'Rehana': pd.Series([92, 81, 96], index=['Maths','Science','Hindi']), 'John': pd.Series([89, 91, 88], index=['Maths','Science','Hindi']), 'Roja': pd.Series([81, 71, 67],	3

	index=['Maths','Science','Hindi']), 'Mannat': pd.Series([94, 95, 99], index=['Maths','Science','Hindi'])} DF = pd.DataFrame(ResultSheet) print(DF) Output of the above code: Based on the given information, answer the questions in Python code: 1) He wants to add a new column with name of student 'Prem' in above data frame 2) He wants to set all the values to zero in data frame 3) He wants to delete the row of science marks	
35.	Draw the following bar graph representing the number of students in each class.  	3
36.	*A dataframe 'Books' contains data of products ([name, publication, year, amt]) stored in the following format* *[["LetusC","BPB",2010,320] , ["Python", "Wiley",2020,500]]* *Write a code to perform the following functions:* *1. Add one more row to it.* *2. Display last two records from the dataframe.* *3. Increase the price of all the books by BPB publications by Rs. 100/-.*	3
37.	Consider a CSV file "Player.csv" containing details of players. Each row of the file contains data about a player in the following format [P-101,	3

	Naveen	Rehana	John	Roja	Mannat
Maths	90	92	89	81	94
Science	91	81	91	71	95
Hindi	97	96	88	67	99

	'Virat' 'Cricket'] where P-101 is ID , 'Virat' is name and 'Cricket' is the name of the sport. The file does not contain a header row. Write a code in Python to read data from Player.csv and display the details of those players who play 'VolleyBall".	
	Section-II **Both the Case study based questions are compulsory.**	
38.	"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: (a) Out of LAN, WAN and MAN, what type of network will be formed if we interconnect different computers of the campus? Justify.	4

	(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-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.	
39.	Write a program in Python Pandas to create the following DataFrame batsman from a Dictionary: B_NO | Name | Score1 | Score2 1 | Sunil Pillai | 90 | 80 2 | Gaurav Sharma | 65 | 45 3 | Piyush Goel | 70 | 90 4 | Kartik Thakur | 80 | 76 Perform the following operations on the DataFrame : 1) Add both the scores of a batsman and assign to column "Total" 2) Display the highest score in both Score1 and Score2 of the DataFrame. 3) Change name of Sunil Pillai to Sumeet Pillai. 4) Display the DataFrame	4