



DELHI PUBLIC SCHOOL

SAIL Township, Ranchi

Pre-Board-I Examination 2019

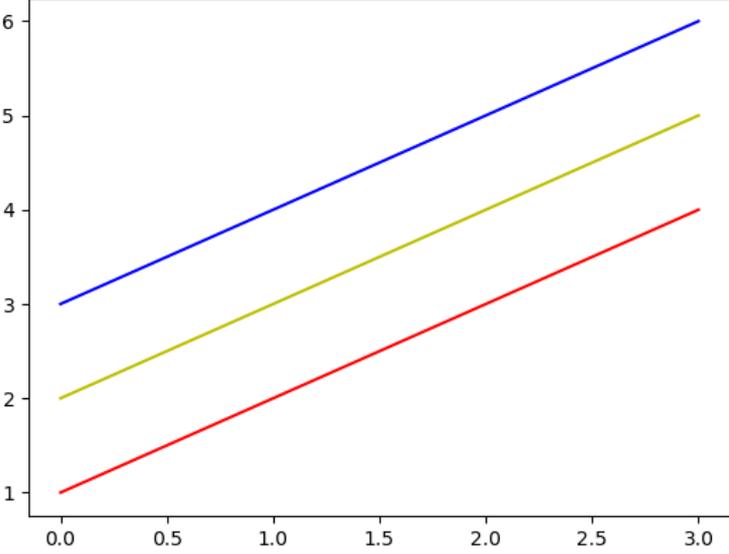
Class-XII
Time: 3 Hrs

Subject: Informatics Practices
FM: 70

General Instructions:

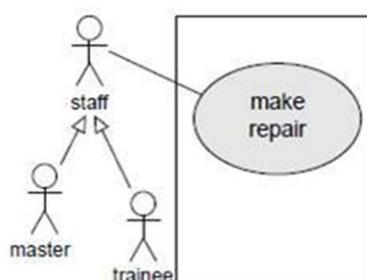
- All questions are compulsory.
- Question Paper is divided into 4 sections A, B, C and D.
- **Section A** comprises of questions (1 & 2) comprises 12&18=>**30 marks**
 - o **Question 1** comprises Data Handling-2(DH-2) (Series, Numpy)
 - o **Question 2** comprises of question from Data Handling -2(DH-2)(Data Frames and its operations)
- **Section B** comprises of questions from Basic Software Engineering, comprises **15 marks**.
- **Section C** comprises of questions from Data Management-2(DM-2) comprises **15 marks**.
- **Section D** comprises of questions from Society, Law and Ethics-2(SLE-2) comprises **10 marks**.

SECTION-A		
1.	Answer the following questions:	
(a)	Find the <u>output</u> of following program. import numpy as np d=np.array([10,20,30,40,50,60,70]) print(d[3:])	1
ANS:	[40 50 60 70]	
(b)	Fill in the blank with a Numpy function to show the Variance. import numpy as np data=np.array([1,2,3,4,5,6]) print(np.__(data, ddof=0))	1
ANS:	print(np.var(data,ddof=0))	
(c)	Sameer wants to plot a bar graph for the given set of values of Departments on x-axis and number of Employees who work at the Departments on y-axis. Complete the code to perform the following : (i) To plot the bar graph in statement 1 (ii) To display the graph in statement 2 import matplotlib.pyplot as plt x=['HR', 'Account', 'Admin', 'Mgmt'] y=[10,20,30,40] _____ Statement 1 _____ Statement 2	1
ANS:	(i) plt.bar(x,y) (ii) plt.show()	
	OR	
(d)	Mr. Harry wants to draw a line chart using a list of elements named LIST. Complete the code to perform the following operations: (i) To plot a line chart using the given LIST of Red colour. (ii) To give a y-axis label to the line chart named "Sample Numbers". import matplotlib.pyplot as plt LIST=[10,20,30,40,50,60] _____ _____ plt.show()	1
ANS:	(i) PLINE.plot(LIST, 'r') (ii) PLINE.ylabel("Sample Numbers")	
(e)	Write the output of the following code : import numpy as np array1=np.array([10,12,14,16,18,20,22])	1

	<pre>array2=np.array([10,12,15,16,12,20,12]) a=(np.where(array1==array2)) print(array1[a])</pre>	
ANS:	[10 12 16 20]	
(e)	Write a code to plot the speed of a passenger train as shown in the figure given below:	2
		
ANS:	<pre>import numpy as np import matplotlib.pyplot as plt x=np.arange(1,5,1) plt.plot(x,'r') # 'r' makes red colour of the line generated according to value of x plt.plot(x+1, 'y') # 'y' makes yellow colour of the line according to value of x+1 plt.plot(x+2, 'b') # 'b' makes blue colour of the line according to value of x+2 plt.show()</pre>	
(f)	Define (i) Series (ii) arrange() function with an example	2
ANS:	<p>(i) Pandas Series is a one-dimensional labeled array capable of holding data of any type (integer, string, float, python objects, etc.). The axis labels are collectively called index. Example:</p> <pre>Import pandas as pd # simple array data =pd.series([1,2,3,4,5]) print data</pre> <p>(ii) <i>arange(a,b,c):</i> arange() function generates values from starting value(a) up to before stop value (b) incremented by third value(c) which is optional. In the above example, [1, 2, 3, 4] values will be generated for x variable, where initial value is 1, final is 5 and increment value is 1.</p>	
(g)	Write a NumPy program to create a 3x3 identity matrix, i.e. diagonal elements are 1, the rest are 0. Replace all 0 to random number from 10 to 20.	3
ANS:	<pre>import numpy as np array1=np.identity(3) print(array1) x=np.where(array1==0) for i in x: array1[x]=np.random.randint(low=10, high=20) print(array1)</pre>	
2.	Answer the following questions:	
(a)	_____ 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
ANS:	(iii) Reindex	
(b)	Write the command using insert() function to add a new column in the last place(3rd place) named "Rank" from the list Stud=[1, 5, 2] in an existing DataFrame named Student already having 2 columns.	1

ANS:	Student.insert(loc=3,column="Rank", value=Stud)																									
(c)	Consider the following python code and write the output for statement xx: import pandas as pd import numpy as np s = pd.Series([1, 2, 4, 5,6,8,10,12,16,20]) r=s.quantile(.3) print(r) # ----- xx	1																								
ANS:	a 11.8 b 8.2 Name: 0.2, dtype: float64 Note – It returns 20% quantile																									
(d)	Write a python code to add a column "Price" of a Series (100, 150, 200, 250, 300) to DataFrame.	1																								
ANS:	df ["Price"]= pd.Series[100, 150, 200, 250, 300] print(df)																									
(e)	What is Pivoting? Name any two functions of Pandas which support pivoting.	2																								
ANS:	Pivoting means to use unique values from specified index/columns to form apex of the resulting DataFrame. Pivot() and pivot_table() methods																									
(f)	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]]	2																								
ANS:	import pandas as pd df = pd.DataFrame([[1, 2], [3, 4]], columns = ['a', 'b']) df2 = pd.DataFrame([[5, 6], [7, 8]], columns = ['a', 'b']) df = df.append(df2)																									
(g)	Given a data frame df1 as shown below: <table border="1"> <thead> <tr> <th>City</th> <th>Maxtemp</th> <th>MinTemp</th> <th>RainFall</th> </tr> </thead> <tbody> <tr> <td>Delhi</td> <td>40</td> <td>32</td> <td>24.1</td> </tr> <tr> <td>Bengaluru</td> <td>31</td> <td>25</td> <td>36.2</td> </tr> <tr> <td>Chennai</td> <td>35</td> <td>27</td> <td>40.8</td> </tr> <tr> <td>Mumbai</td> <td>29</td> <td>21</td> <td>35.2</td> </tr> <tr> <td>Kolkata</td> <td>39</td> <td>23</td> <td>41.8</td> </tr> </tbody> </table> <p>(i) Write command to compute sum of every column of the data frame. (ii) Write command to compute mean of column Rainfall. (iii) Write command to compute average maxTemp, Rainfall for first 5 rows.</p>	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	3
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ANS:	(i) df1.sum() (ii) df1['Rainfall'].mean() (iii) df1.loc[:11, 'maxtemp': 'Rainfall'].mean()																									
(h)	Find the output of the following code: import pandas as pd data = [{'a': 10, 'b': 20},{'a': 6, 'b': 32, 'c': 22}] <i>#with two column indices, values same as dictionary keys</i> df1 = pd.DataFrame(data, index=['first', 'second'], columns=['a', 'b']) <i>#With two column indices with one index with other name</i> df2 = pd.DataFrame(data, index=['first', 'second'], columns=['a', 'b1']) print(df1) print(df2)	3																								
ANS:	 a b first 10 20 second 6 32 a b1 first 10 NaN second 6 NaN																									

(i)	<p>Write the code in pandas to create the following dataframes :</p> <pre>df1 mark1 mark2mark1 mark2 10 150 30 20 40 45 1 20 25 15 302 20 30 40 703 50 30</pre> <p>df2</p> <p>Write the commands to do the following operations on the dataframes given above :</p> <p>(i) To add dataframes df1 and df2. (ii) To subtract df2 from df1 (iii) To rename column mark1 as marks1in both the dataframes df1 and df2. (iv) To change index label of df1 from 0 to zero and from 1 to one.</p>	4
ANS:	<pre>import numpy as np import pandas as pd df1 = pd.DataFrame({'mark1':[30,40,15,40], 'mark2':[20,45,30,70]}); df2 = pd.DataFrame({'mark1':[10,20,20,50], 'mark2':[15,25,30,30]}); print(df1) print(df2) (i) print(df1.add(df2)) (ii) print(df1.subtract(df2)) (iii) df1.rename(columns={'mark1':'marks1'}, inplace=True) print(df1) (iv) df1.rename(index = {0: "zero", 1:"one"}, inplace = True) print(df1)</pre>	
SECTION-B [15 Marks] <i>(Software Engineering)</i>		
3.	Answer the following questions:	
(a)	<p>Which software model is best suitable for linear-sequential life cycle?</p> <p>(i) Waterfall (ii) Spiral (iii) Concurrent (iv) None of the above</p>	1
ANS:	Waterfall model	
(b)	<p>_____ is the process of checking the developed software for its correctness and error free working:</p> <p>(i) Specification (ii) Design/Implementation (iii) Validation/Testing (iv) Evolution</p>	1
ANS:	Validation/Testing	
(c)	Write down any one benefit of pair programming.	1
ANS:	Improved code quality: As second partner reviews the code simultaneously, it reduces the chances of mistake.	
(d)	How a Scrum Master differs from a traditional project manager in Scrum-Process? Explain.	2
ANS:	<p>->The Scrum Master is the servant leader to the Product Owner, Development Team and Organization with no hierarchical authority over the team but rather more of a facilitator, the Scrum Master ensures that the team adheres to Scrum theory, practices, and rules. ->The Scrum Master protects the team by doing anything possible to help the team perform at the highest level.</p>	
(e)	Write down any one situation where spiral delivery model is applied. Write one advantage and one disadvantage of Spiral delivery model.	3
ANS:	<p>Situations to use/apply spiral model:</p> <ul style="list-style-type: none"> • When project is large, When releases are required to be frequent, When risk and costs evaluation is important • For medium to high-risk projects 	

	<p>Advantage:</p> <ul style="list-style-type: none"> • Additional functionality or changes can be done at a later stage • Cost estimation becomes easy as the prototype building is done in small fragments <p>Disadvantage:</p> <p>Risk of not meeting</p>	
(f)	Naveen, Subham and Asish are three developers working on an exciting new app, and the launch day is just a day away. Naveen creates an unmanaged package and saves it in Ashish's folder. Subham also writes a new piece of code and saves it in Ashish's folder. What could go wrong on the day of the launch? Explain and also mention how version control can help teams in this situation.	3
ANS:	<p>->The team members are not working in a systematic way and they are not saving the versions of their work. Changes made in one part of the software can be incompatible with those made by another developer working at the same time.</p> <p>-> Version control exists to solve these problems, and it's within easy reach for every developer. Version control helps teams solve these kinds of problems, tracking every individual change by each contributor and helping prevent concurrent work from conflicting.</p> <p>-> Further, in all software development, any change can introduce new bugs on its own and new software can't be trusted until it's tested. So testing and development proceed together until a new version is ready.</p>	
(g)	Draw a use case diagram and identify the actors for the situations (i) do (ii) as directed: (i) A training can be made by a Trainer, a Trainee or any other Technical staff. (ii) Consider an Institution. Identify at least three different actors that interact with this system.	4
ANS:	 <p>(i) Actors : Trainer, Trainee An actor is any entity (user or system) that interacts with the system of interest.</p> <p>(ii) For an Institute, includes:</p> <ul style="list-style-type: none"> • Trainee/Student • Trainer • Director/Manager 	
ANS:	<p>A teacher is conducting an interview with a student. In the course of that, the teacher always has to grade the student. Father and son cook dinner. In the course of that, one of them always has to load the dishwasher.</p> <ol style="list-style-type: none"> 1. B can execute the same use cases as A. 2. B inherits all of A's associations. 	
<p>SECTION-C [15 Marks] (Django, SQL-connectivity, SQL)</p>		
4.	Answer the following questions:	
(a)	Write the Django command to start a new app named 'users' in an existing project?	1
ANS:	python manage.py startapp users	
(b)	What is the use of COMMIT in sql?	1
ANS:	Commit is used to save all the DML transactions, and once saved they cannot be rolled back.	
(c)	CSV stands for _____	
ANS:	Comma separated values	
(d)	NULL value means : (i) 0 value (ii) 1 value (iii) None value (iv) None of the above	1
ANS:	None value	
(e)	Connection.is_connected() is the MYSQL function to : (i) establish a connection to a mysql database from python. (ii) verify whether the python application is connected to mysql database. (iii) traverse through records in mysql database. (iv) None of the above	1
ANS:	verify whether the python application is connected to mysql database.	
(f)	Write a set of code to open the database SCHOOL, followed by creating a table Student, considering the password of Database is <i>mysql</i> .	2

	<pre>import mysql.connector mydb=mysql.connector.connect(host="localhost",user="root",passwd="root", database="school") mycursor=mydb.cursor() mycursor.execute("create table student(rollno int(3) primary key, name varchar(20),age int(2))")</pre>																																																		
(g)	<p>Himanshu is a new learner of MySQL. Help him in understanding the difference between the following :</p> <p>(i) Where and having clause (ii) Count(column_name) and count(*)</p>	3																																																	
ANS:	<p>(i)Where clause is used to show data set for a table based on a condition and having clause is used to put condition on the result set that comes after using Group by clause. (ii)COUNT(*) returns the number of items in a group, including NULL values and duplicates. COUNT(expression) evaluates expression for each row in a group and returns the number of non null values. Candidate Key – A Candidate Key can be any column or a combination of columns that can qualify as unique key in database. There can be multiple Candidate Keys in one table. Each Candidate Key can qualify as Primary Key. Primary Key – A Primary Key is a column or a combination of columns that uniquely identify a record. Only one Candidate Key can be Primary Key. A table can have multiple Candidate Keys that are unique as single column or combined multiple columns to the table. They are all candidates for Primary Key.</p>																																																		
(h)	<p>On the basis of following table answer the given questions: Table: CUSTOMER_DETAILS</p> <table border="1"> <thead> <tr> <th>Cust_ID</th> <th>Cust_Name</th> <th>Acct_Type</th> <th>Accumlt_Amt</th> <th>DOJ</th> <th>Gender</th> </tr> </thead> <tbody> <tr> <td>C001</td> <td>Madhav</td> <td>Saving</td> <td>101250</td> <td>1992-02-19</td> <td>M</td> </tr> <tr> <td>C002</td> <td>Raushan</td> <td>Current</td> <td>132250</td> <td>1998-01-11</td> <td>M</td> </tr> <tr> <td>C004</td> <td>Sandeep</td> <td>Saving</td> <td>18200</td> <td>1998-02-21</td> <td>M</td> </tr> <tr> <td>C005</td> <td>Manoj</td> <td>Current</td> <td>NULL</td> <td>1994-02-19</td> <td>M</td> </tr> </tbody> </table> <p>(i) Write the degree and cardinality of the above table. (ii) What will be the output of the following query : Select max(DOJ) From Customer_Details; (iii) Write the SQL query to delete the row from the table where customer has no accumulated amount.</p>	Cust_ID	Cust_Name	Acct_Type	Accumlt_Amt	DOJ	Gender	C001	Madhav	Saving	101250	1992-02-19	M	C002	Raushan	Current	132250	1998-01-11	M	C004	Sandeep	Saving	18200	1998-02-21	M	C005	Manoj	Current	NULL	1994-02-19	M	3																			
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ANS:	<p>(i) The degree is 6 and cardinality is 5. (ii) +-----+----- max(DOJ) +-----+----- 1998-02-21 +-----+-----</p> <p>(iii) Delete from Customer_Details where Accumlt_Amt is NULL;</p>																																																		
(i)	<p>Write commands in SQL for (i) to (iii) and output for (iv) and (v). Table : Store</p> <table border="1"> <thead> <tr> <th>StoreId</th> <th>Name</th> <th>Location</th> <th>City</th> <th>NoOfEmp</th> <th>DateOpen</th> <th>SalesAmt</th> </tr> </thead> <tbody> <tr> <td>S101</td> <td>Planet Fashion</td> <td>Bandra</td> <td>Mumbai</td> <td>7</td> <td>2015-10-16</td> <td>40000</td> </tr> <tr> <td>S102</td> <td>Vogue</td> <td>Karol Bagh</td> <td>Delhi</td> <td>8</td> <td>2015-07-14</td> <td>120000</td> </tr> <tr> <td>S103</td> <td>Trends</td> <td>Powai</td> <td>Mumbai</td> <td>10</td> <td>2015-06-24</td> <td>30000</td> </tr> <tr> <td>S104</td> <td>SuperFashion</td> <td>Thane</td> <td>Mumbai</td> <td>11</td> <td>2015-02-06</td> <td>45000</td> </tr> <tr> <td>S105</td> <td>Annabelle</td> <td>South Extn.</td> <td>Delhi</td> <td>8</td> <td>2015-04-09</td> <td>60000</td> </tr> <tr> <td>S106</td> <td>Rage</td> <td>Defence Col</td> <td>Delhi</td> <td>5</td> <td>2015-03-01</td> <td>20000</td> </tr> </tbody> </table>	StoreId	Name	Location	City	NoOfEmp	DateOpen	SalesAmt	S101	Planet Fashion	Bandra	Mumbai	7	2015-10-16	40000	S102	Vogue	Karol Bagh	Delhi	8	2015-07-14	120000	S103	Trends	Powai	Mumbai	10	2015-06-24	30000	S104	SuperFashion	Thane	Mumbai	11	2015-02-06	45000	S105	Annabelle	South Extn.	Delhi	8	2015-04-09	60000	S106	Rage	Defence Col	Delhi	5	2015-03-01	20000	3
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	<p>(i) To display Stores names, Location and DateOfOpen of stores that were opened before 1st March, 2015.</p> <p>(ii) To display name and location of those store which have either 'u' as second character in their name.</p> <p>(iii) To display the City and the number of stores located in that City, only if number of stores is more than 2.</p>	
ANS:	<pre>mysql> Select Name,SalesAmt from Store order by noOfEmp; mysql> Select city, sum(SalesAmt) from store group by City; mysql> Select count(*),City from store group by City having count(*)>2; mysql> Select Min(DateOpen) from Store;</pre> <pre>+-----+-----+ Min(DateOpen) +-----+-----+ 2015-02-06 +-----+-----+</pre> <pre>mysql> Select Count(StoreId), NoOfEmp from Store group by NoOfemp having max(SalesAmt) <60000;</pre> <pre>+-----+-----+ Count(StoreId) NoOfEmp +-----+-----+ 1 10 1 11 1 5 1 7 +-----+-----+</pre>	
SECTION-D [10 Marks] <i>(Cyber Security, Law and Ethics)</i>		
5.	Answer the following questions:	
(a)	Which of the following is not an intellectual property? (i) A poem written by a poet (ii) An original painting made by a painter (iii) Trademark of a Company (iv) A remixed song	1
ANS:	A remixed song is not an intellectual property	1
(b)	Madaldeo has stolen a credit card. He used that credit card to buy an i-Phone. What type of offence has he committed?	
ANS:	He has committed a fraud	
(c)	Name the primary law in India dealing with cybercrime and electronic commerce.	1
ANS:	The primary law is Information Technology Act 2000.	
(d)	Susmita has received an email from her bank stating that there is a problem with her account. The email provides instructions and a link, by clicking on which she can logon to her account and fix the problem. Help Susmita by telling her the precautions she should take when she receives these type of emails.	2
	She should check whether it is a valid bank site or not by checking in the url https. It is always better to type the url and then login to the site. She should not click on the link provided in the email.	
(e)	Explain any two ways in which technology can help students with disabilities.	2
ANS:	Different types of ICT tools assist people with learning disabilities to achieve positive outcomes. They are : <ul style="list-style-type: none"> • Talking Word processors • Screen Readers • Conversion of local language to Braille • Eye Tracking mouse 	
(f)	Explain the role of online social media campaigns, crowdsourcing and smart mobs in society.	3
ANS:	Role of Social Media Campaigns:- -> A social media campaign should focus around a singular business goal, whether it's on Facebook or Instagram. Common goals for a social media campaigns include: Getting feedback from users. Building email marketing lists Increasing website traffic	

<p>-> Crowdsourcing is the practice of engaging a 'crowd' or group for a common goal — often innovation, problem solving, or efficiency. It is powered by new technologies, social media and web 2.0. Crowdsourcing can take place on many different levels and across various industries.</p> <p>-> Smart mobs, so named because each person in the group uses technology to receive information on where to go and what to do. This ability to stay on top of current events makes smart mobs extremely effective.</p>	
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