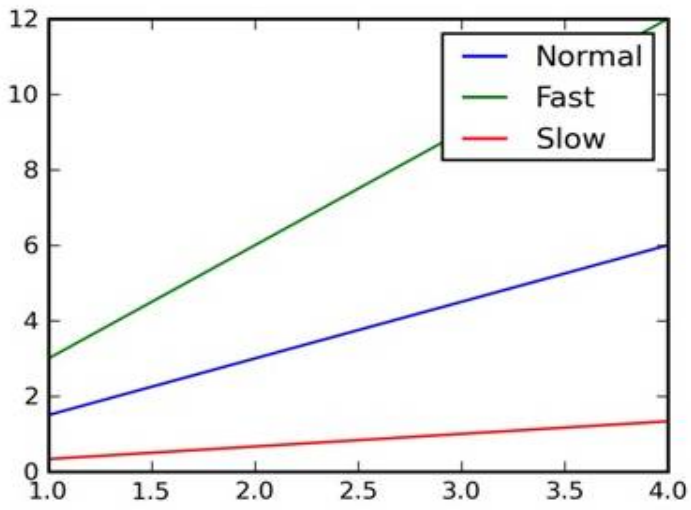
CLASS XII
INFORMATICS PRACTICES NEW (065)
SAMPLE QUESTION PAPER (2019-20)

Max Marks: 70 **Time: 3 hrs**

General Instructions:

- All questions are compulsory
- Question Paper is divided into 4 sections A,B,C and D.
- Section A comprises of questions(1 and 2)
  (i) Question 1 comprises Data Handling-2(DH-2)(Series,Numpy)
  (ii) 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.
- Section C comprises of questions from Data Management-2(DM-2)
- Section C comprises of questions from Society, Law and Ethics-2(SLE-2)

Section A			
Answer the following questions :			
1	a)	Find the output of following program. import numpy as np d=np.array([10,20,30,40,50,60,70]) print(d[-4:])	**1**
	b)	Fill in the blank with appropriate numpy method to calculate and print the variance of an array. import numpy as np data=np.array([1,2,3,4,5,6]) print(np.___(data,ddof=0)	**1**
	c)	Mr. Sanjay wants to plot a bar graph for the given set of values of subject on x-axis and number of students who opted for that subject 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=['Hindi', 'English', 'Science', 'SST'] y=[10,20,30,40] _____ Statement 1 _____ Statement 2	**1**

		OR 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, (ii) To give a y-axis label to the line chart named "Sample Numbers". import matplotlib.pyplot as PLINE LIST=[10,20,30,40,50,60] _____ Statement 1 _____ Statement 2 PLINE.show()	
	d)	Write the output of the following code : import numpy as np array1=np.array([10,12,14,16,18,20,22]) array2=np.array([10,12,15,16,12,20,12]) a=(np.where(array1==array2)) print(array1[a])	**2**
	e)	Write a code to plot the speed of a passenger train as shown in the figure given below: 	**2**
	f)	What is series? Explain with the help of an example.	**2**
	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 **OR** Write a NumPy program to create a 3x3 identity matrix, i.e. non diagonal elements are 1, the rest are 0. Replace all 0 to random number from 1 to 10	**3**

Answer the following questions			
2	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**
	b)	Hitesh wants to display the last four rows of the dataframedf and has written the following code : **df.tail()** But last 5 rows are being displayed. Identify the error and rewrite the correct code so that last 4 rows get displayed. **OR** Write the command using Insert() function to add a new column in the last place(3rd place) named "Salary" from the list Sal=[10000,15000,20000] in an existing dataframe named EMP already having 2 columns.	**1**
	c)	Consider the following python code and write the output for statement S1 import pandas as pd K=pd.series([2,4,6,8,10,12,14]) K.quantile([0.50,0.75]) ---------- S1	**1**
	d)	Write a small python code to drop a row fromdataframe labeled as 0.	**1**
	e)	What is Pivoting? Name any two functions of Pandas which support pivoting.	**2**
	f)	Write a python code to create a dataframe with appropriate headings from the list given below : ['S101', 'Amy', 70], ['S102', 'Bandhi', 69], ['S104', 'Cathy', 75], ['S105', 'Gundaho', 82] **OR** Write a small python codeto create a dataframewith headings(a and b) from the list given below : [[1,2],[3,4],[5,6],[7,8]]	**2**
	g)	Consider the following dataframe, and answer the questions given below: import pandas as pd df = pd.DataFrame({"Quarter1":[2000, 4000, 5000, 4400, 10000], "Quarter2":[5800, 2500, 5400, 3000, 2900], "Quarter3":[20000, 16000, 7000, 3600, 8200], "Quarter4":[1400, 3700, 1700, 2000, 6000]}) (i) Write the code to find mean value from above dataframedf over the index and column axis. (Skip NaN value) (ii) Use sum() function to find the sum of all the values over the index axis. (iii) Find the median of the dataframedf.	**3**

OR

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 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

h) Find the output of the following code: **3**

```
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)
```

i) Write the code in pandas to create the following dataframes : **4**

df1

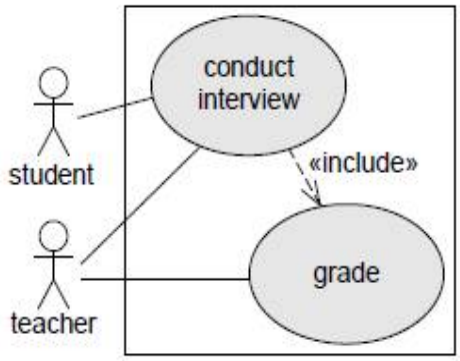
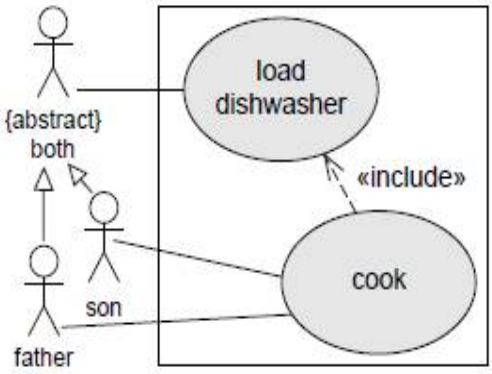
	mark1	mark2
0	10	150
1	40	45
2	15	302
3	40	703

df2

	mark1	mark2
0	30	20
1	20	25
2	20	30
3	50	30

Write the commands to do the following operations on the dataframes given above :
(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.

Section B			
3	a)	Which software model is best suitable for client server application? (i) Waterfall (ii) Spiral (iii) Concurrent (iv) None of the above	**1**
	b)	_____ is the process of checking the developed software for its correctness and error free working (i) Specification (ii) Design/Implementation (iii) Validation/Testing (iv) Evolution	**1**
	c)	Write down any one benefit of pair programming.	**1**
	d)	In the Scrum process, a ScrumMaster differs from a traditional project manager. Justify the statement. **OR** List any two differences betweenIncremental model and Spiral model in developing complex software projects.	**2**
	e)	Write down any one situation where waterfall software process can be used. Also mention one advantage and one disadvantage of waterfall software process. **OR** Write down any one situation where spiral delivery model can be used. Also mention one advantage and one disadvantage of spiral delivery model.	**3**
	f)	Gunveen, Marshy and Aloha are three developers working on an exciting new app, and the launch day is just a day away. Gunveen creates an unmanaged package and saves it Aloha's folder. Marshy also writes a new piece of code and saves it in Aloha's folder. What could go wrong on the day of the launch? Explain and also mention how version control can help teams in this scenario.	**3**
	g)	Draw a use case diagram and identify the actors for the situations (i) do (ii) as directed: (i) A repair can be made by a master, a trainee or any other repair shop employee. (ii) Consider an ATM system. Identify at least three different actors that interact with this system.	**4**

		OR (i) Look at the following use case diagrams and write the actors and the situation depicted by the use case diagrams :   (ii) Look at the use case diagram shown below and explain the relationship depicted between A and B	
Section C			
4	a)	Write the Django command to start a new app named 'users' in an existing project?	**1**
	b)	What is the use of COMMIT in sql ? **OR** What is the function of ALTER command?	**1**
	c)	CSV stands for _____	**1**
	d)	NULL value means : (i) 0 value (ii) 1 value (iii) None value (iv) None of the above	**1**

	e)	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**
	f)	Shewani has recently started working in MySQL. Help her in understanding the difference between the following : (i) Where and having clause (ii) Count(column_name) and count(*)	**3**
	g)	On the basis of following table answer the given questions: Table: CUSTOMER_DETAILS +---------+-----------+-----------+-------------+------------+--------+ | Cust_ID | Cust_Name | Acct_Type | Accumlt_Amt | DOJ | Gender | +---------+-----------+-----------+-------------+------------+--------+ | CNR_001 | Manoj | Saving | 101250 | 1992-02-19 | M | | CNR_002 | Rahul | Current | 132250 | 1998-01-11 | M | | CNR_004 | Steve | Saving | 18200 | 1998-02-21 | M | | CNR_005 | Manpreet | Current | NULL | 1994-02-19 | M | +---------+-----------+-----------+-------------+------------+--------+ (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.	**3**
	h)	Write commands in SQL for (i) to (iv) and output for (v) and (vi). **Table : Store** **+---------+---------------+---------------+--------+---------+------------+----------+** **| 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 Colony | Delhi | 5 | 2015-03-01 | 20000 |** **+---------+---------------+---------------+--------+---------+------------+----------+** (i) To display names of stores along with SalesAmount of those stores that have 'fashion' anywhere in their store names. (ii) To display Stores names, Location and DateOfOpen of stores that were opened before 1st March, 2015. (iii) To display name and location of those store which have either 'u' as second character in their name. (iv) To display the City and the number of stores located in that City, only if number of stores is more than 2. (v) Select Min(DateOpen) from Store; (vi) Select Count(Storeid), Noofemp From Store Group By Noofemp Having Max(Salesamt)<60000;	**4**

		OR (i) In a school, a database named "**school"** is created in mysql whose password is "**cbse"**. Smith is trying to add a new record of a student havingdetails(3,'Michelle','Agartala') in a"**student"**table. (ii) Write the code in python to read the contents of "number.csv" file consisting of data from a mysql table and print the data of the table on the screen in tabular form of the table.	
Section D			
5	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**
	b)	Jhilmalini has stolen a credit card. She used that credit card to purchase a laptop. What type of offence has she committed?	**1**
	c)	Name the primary law in India dealing with cybercrime and electronic commerce.	**1**
	d)	Sutapa 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 Sutapa by telling her the precautions she should take when she receives these type of emails.	**2**
	e)	Explain any two ways in which technology can help students with disabilities.	**2**
	f)	Explain the role of online social media campaigns, crowdsourcing and smart mobs in society. **OR** Ms Samtha has many electronics gadgets which are not usable due to outdated hardware and software. Help her to find any three best ways to dispose the used electronic gadgets.	**3**

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INFORMATICS PRACTICES - New (065)
Marking Scheme - SQP (2019-20)

Max. Marks: 70 **Time: 3 hrs**

Section A			
Q1	a) Ans	[40 50 60 70]	(1 mark for correct output)
	b) Ans	print(**np.var**(data,ddof=0))	(1 mark for appropriate function var)
	c)Ans	(i) plt.bar(x,y) (ii) plt.show() **OR** (i) PLINE.plot(LIST) (ii) PLINE.ylabel("Sample Numbers")	(½ mark for each correct code)
	d) Ans	[10 12 16 20]	(1 mark for correct output)
	e) Ans	import matplotlib.pyplot as plt import numpy as np x = np.arange(1, 5) plt.plot(x, x*1.5, label='Normal') plt.plot(x, x*3.0, label='Fast') plt.plot(x, x/3.0, label='Slow') plt.legend() plt.show()	2 marks (½ mark for each import statement) (½ mark for using arange()) (½ mark for using plot(), legend() and show())

	f) Ans	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
		importpandas as pd
		
		# simple array
		data =pd.series([1,2,3,4,5])
		print data
			2 marks
			
			(1 mark for definition and 1 mark for example)

	g) Ans	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)	3 marks 1 mark for creation of identity matrix 1 mark for identification of position of 0 1 mark for changing value of 0 to random number

		OR import numpy as np Z = np.arange(9).reshape(3,3) print (Z) x=np.where((Z%2)==0) for i in x: Z[x]=np.random.randint(low=10,high=20) print(Z)	1 mark for creation of matrix 1 mark for identification of even number 1 mark for changing value of 0 to random number
Q2	a) Ans	(ii) reindex	(1 mark for correct answer)
	b) Ans	df.tail(4) **OR** EMP.insert(loc=3,column="Salary",value=Sal)	(1 mark for correct answer)
	c) Ans	0.50 8.0 0.75 11.0	(1 mark for each correct line of output)

	d) Ans	# Drop rows with label 0
		df = df.drop(0)
		print(df)
			(1 mark for giving complete and correct code)

	e) Ans	Pivoting means to use unique values from specified index/columns to form apex of the resulting dataframe. Pivot() and pivot_table() methods	(1 mark for correct definition and ½ mark for each correct example)

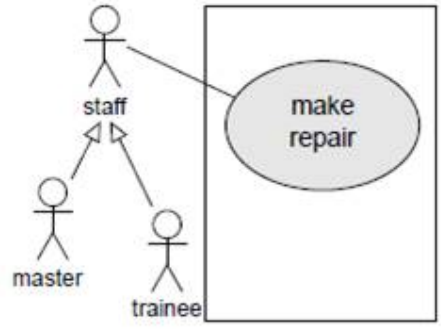
	f) Ans	import pandas as pd
		# initialize list of lists
		data = [['S101', 'Amy', 70], ['S102', 'Bandhi', 69], ['S104', 'Cathy', 75], ['S105', 'Gundaho', 82]]
		# Create the pandas DataFrame
		df = pd.DataFrame(data, columns = ['ID', 'Name', 'Marks'])
		# printdataframe.
		print(df)
		OR
		import pandas 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)
			2 marks
			(½ mark for correct initialization, 1 mark for correct dataframe and ½ mark for printing dataframe)

	g)Ans	(i) print(df.mean(axis = 1, skipna = True)) print(df.mean(axis = 0, skipna = True)) (ii) print(df.sum(axis = 1, skipna = True)) (iii) print(df.median())	3 marks (1 mark for each correct code)

		OR (i) df1.sum() (ii) df1['Rainfall'].mean() (iii) df1.loc[:11, 'maxtemp':'Rainfall'].mean( )	
	h)Ans	a b first 10 20 second 6 32 a b1 first 10 NaN second 6 NaN	3 marks (½ mark for each correct output)

	i)Ans	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)
			4 marks
			(1 mark for creating each dataframe and ½ mark for each correct command)

		Section B	
Q3	a)Ans	Concurrent Process model	(1 mark for correct answer)
	b)Ans	Validation/Testing	(1 mark for correct answer)
	c)Ans	Improved code quality: As second partner reviews the code simultaneously, it reduces the chances of mistake.	(1 mark for correct answer)
	d)Ans	→ The ScrumMaster 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 ScrumMaster ensures that the team adheres to Scrum theory, practices, and rules. →The ScrumMaster protects the team by doing anything possible to help the team perform at the highest level. **OR** →Incremental model works on the stage-wise development of a complex project that involves real time data whereas Spiral model works on risk analysis of a real time situation. →Spiral model is a combination of both Incremental as well as Waterfall method.	2 marks (1 mark for correct answer and 1 mark for correct justification)

	e)Ans	Situations to use/apply waterfall model i) When project is small ii) When problem is static. iii) Clear and fixed requirements. Stable problem definition. Technology is static. **Advantage** : Simple and easy to understand **Disadvantage** : No working software till the last phase **OR** Situations to use/apply spiral model When project is large,When releases are required to be frequent,When risk and costs evaluation is important For medium to high-risk projects **Advantage**- Additional functionality or changes can be done at a later stage Cost estimation becomes easy as the prototype building is done in small fragments **Disadvantage**-Risk of not meeting	3 marks (1 mark for any correct area of use 1 mark for correct advantage and 1 mark for correct disadvantage)
	f)Ans	→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. →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. →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.	3 marks (1 mark for identifying the problem, 1 mark for explaining version control and 1 mark for its advantages)
	g)Ans	 Actors : Master, Trainee An actor is any entity (user or system) that interacts with the	4 marks (2 marks for drawing use case and 1 mark for each actor)

		system of interest. For an ATM, this includes: • Bank Customer • ATM Maintainer • Central Bank Computer **OR** 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. 1. B can execute the same use cases as A. 2. B inherits all of A's associations.	(1½ mark for each correct explanation and 1 mark explaining the relationship)
Section C			
Q4	a)Ans	python manage.py startapp users	(1 mark for correct answer)
	b)Ans	Commit is used to save all the DML transactions, and once saved they cannot be rolled back. **OR** Alter command is used to change/modify the structure of database object like a table, index, etc.	(1 mark for correct answer)
	c)Ans	Comma separated values	(1 mark for correct answer)
	d)Ans	None value	(1 mark for correct answer)
	e)Ans	verify whether the python application is connected to mysql database.	(1 mark for correct answer)
	f)Ans	(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.	3 marks (1 mark for each correct difference)
	g)Ans		3 marks

		(i) The degree is 6 and cardinality is 5. (ii) +------------+ | max(DOJ) | +------------+ | 1998-02-21 | +------------+ **(**iii)Delete from Customer_Details where Accumlt_Amt is NULL**;**	(½ mark for correct degree and ½ mark for cardinality) (1 mark for correct output) (1 mark for correct query)

	h)Ans	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;
		
		+---------------+
		| Min(DateOpen) |
		+---------------+
		| 2015-02-06 |
		+---------------+
		mysql> Select Count(StoreId), NoOfEmp from Store group by NoOfemp having max(SalesAmt)<60000;
		+----------------+---------+
		| Count(StoreId) | NoOfEmp |
		+----------------+---------+
		| 1 | 10 |
		| 1 | 11 |
		| 1 | 5 |
		| 1 | 7 |
		+----------------+---------+
		
		OR
		
		i)import mysql.connector
		mydb = mysql.connector.connect(
		host="localhost",
		user="root",
		passwd="cbse",
		database="school"
		)
		mycursor = mydb.cursor()
		mycursor.execute("INSERT INTO student values(3,'Michelle', 'Agartala');")
		mydb.commit()
		
		ii) f = open('numbers.csv', 'r')
		with f:
		reader = csv.reader(f)
		for row in reader:
		for e in row:
		print(e)
			4 marks
			(1 mark for each correct query and ½ mark for each correct output)
			
			(i)
			1 mark for correct connection establishment
			½ mark for activation of cursor and ½ mark for correct executable insert command
			Or 2 full marks for any other correct program
			
			(ii)
			(1 mark for correct opening of csv file in read mode, ½ mark for csv.reader() command and ½ mark for printing content of csv file)

Section D			
Q5	a)Ans	A remixed song is not an intellectual property	(1 mark for correct answer)
	b) Ans	She has committed a fraud	(1 mark for correct answer)
	c) Ans	The primary law is Information Technology Act 2000.	(1 mark for correct answer)
	d) Ans	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.	2 marks (1 mark for correct answer)
	e)Ans	Different types of ICT tools assist people with learning disabilities to achieve positive outcomes. They are : Talking Word processors Screen Readers Conversion of local language to Braille Eye Tracking mouse	2 marks (1 mark for each correct point or any other correct point)
	f)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 →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. →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 **OR** 1. Give Your Electronic Waste to a Certified E-Waste Recycler 2. Donating Your Outdated Technology 3. Give Back to Your Electronic Companies and Drop Off Points.	3 marks (1 mark for one correct role of social media campaign, 1 mark for one correct role of Crowdsourcing and 1 mark for one correct role of Smart mob) (1 mark for each correct ways of disposing e waste)