NEW AGE

2021 CBSE BOARD SAMPLE PAPER

COMPUTER SCIENCE WITH PYTHON

- CBSE SAMPLE PAPER AS PER THE LATEST CBSE SYLLABUS AND MARKING SCHEME

2021 CBSE BOARD Sample Paper includes Marking Scheme Issued by CBSE

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NEW AGE

CLASS XII

Computer Science

CLASS-XII
Code No. 083
2020-21

1. Prerequisites

Computer Science- Class XI

2. Learning Outcomes

- Apply the concept of functions.
- Ability to use Python libraries.
- Apply the concept of file handling.
- Ability to use basic data structures: Stacks.
- Explain the basics of computer networks.
- Ability to use connectivity between Python and SQL.

3. Distribution of Marks:

Unit No.	Unit Name	Theory Marks	Periods	
			Theory	Practical
I	Computational Thinking and Programming – 2	40	50	30
II	Computer Networks	10	10	---
III	Database Management	20	20	10
	Total	70	80	40

Unit I: Computational Thinking and Programming - 2

- Revision of the basics of Python covered in Class XI.
- Functions: scope, parameter passing, mutable/immutable properties of data objects, passing strings, lists, tuples, dictionaries to functions, default parameters, positional parameters, return values, functions using libraries: mathematical and string functions.
- File handling: Need for a data file, Types of file: Text files, Binary files and CSV (Comma separated values) files.

- Text File: Basic operations on a text file: Open (filename – absolute or relative path, mode), Close a text file, Reading and Manipulation of data from a text file, Appending data into a text file, standard input / output and error streams, relative and absolute paths.
- Binary File: Basic operations on a binary file: Open (filename – absolute or relative path, mode), Close a binary file, Pickle Module – methods load and dump; Read, Write/Create, Search, Append and Update operations in a binary file.
- CSV File: Import csv module, functions – Open, Close a csv file, Read from a csv file and Write into a csv file using csv.reader ( ) and csv.writerow( ).
- Using Python libraries: Import Python libraries.
- Data-structures: Lists as covered in Class XI, Stacks – Push, Pop using a list.

Unit II: Computer Networks

- Evolution of Networking: ARPANET, Internet, Interspace Different ways of sending data across the network with reference to switching techniques (Circuit and Packet switching).
- Data Communication terminologies: Concept of Channel, Bandwidth (Hz, KHz, MHz) and Data transfer rate (bps, Kbps, Mbps, Gbps, Tbps).
- Transmission media: Twisted pair cable, coaxial cable, optical fiber, infrared, radio link, microwave link and satellite link.
- Network devices: Modem, RJ45 connector, Ethernet Card, Router, Switch, Gateway, WiFi card.
- Network Topologies and types: Bus, Star, Tree, PAN, LAN, WAN, MAN.
- Network Protocol: TCP/IP, File Transfer Protocol (FTP), PPP, HTTP, SMTP, POP3, Remote Login (Telnet) and Internet, Wireless / Mobile Communication protocol such as GSM, GPRS and WLL.
- Mobile Telecommunication Technologies: 1G, 2G, 3G, 4G and 5G; Mobile processors;

  Electronic mail protocols such as SMTP, POP3, Protocols for Chat and Video Conferencing: VoIP, Wireless technologies such as Wi-Fi and WiMax

☐ Network Security Concepts:

Threats and prevention from Viruses, Worms, Trojan horse, Spams
Use of Cookies, Protection using Firewall, https;
India IT Act, Cyber Law, Cyber Crimes, IPR issues, hacking.

- Introduction To Web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML); Hyper Text Transfer Protocol (HTTP); Domain Names; URL; Website, Web browser, Web Servers; Web Hosting.

Unit III: Database Management

Database Concepts: Introduction to database concepts and its need.

Relational data model: Concept of domain, relation, tuple, attribute, degree, cardinality, key, primary key, candidate key, alternate key and foreign key;

Structured Query Language:

General Concepts: Advantages of using SQL, Data Definition Language and Data Manipulation Language;

Data Types: number / decimal, character / varchar / varchar2, date;

SQL commands covered in class XI (2019-20)

SELECT, DISTINCT, FROM, WHERE, IN, BETWEEN, LIKE, NULL / IS NULL, ORDER BY,GROUP BY, HAVING;

SQL functions: SUM ( ), AVG ( ), COUNT ( ), MAX ( ) and MIN ( );

Joins: equi-join and natural join

Interface of Python with an SQL database

- Connecting SQL with Python
- Creating Database connectivity Applications
- Performing Insert, Update, Delete queries
- Display data by using fetchone(),fetchall(),rowcount

4. Practical

S. No.	Area	Marks (Total=30)
1	Lab Test: 1. Python program (60% logic + 20% documentation + 20% code quality) 2. Small Python program that sends a SQL query to a database and displays the result. A stub program can be provided.	7 5
2	Report file: Minimum 20 Python programs. Out of this at least 4 programs should send SQL commands to a database and retrieve the result	7
3	Project (that uses the concepts that have been learnt in Class 11 and 12)	8
4	Viva voce	3

5. Suggested Practical List:

Python Programming

- Read a text file line by line and display each word separated by a #.
- Read a text file and display the number of vowels/ consonants/ uppercase/ lowercase characters in the file.
- Create a binary file with name and roll number. Search for a given roll number and display the name, if not found display appropriate message.
- Create a binary file with roll number, name and marks. Input a roll number and update the marks.
- Remove all the lines that contain the character `a' in a file and write it to another file.
- Write a random number generator that generates random numbers between 1 and 6 (simulates a dice).
- Write a Python program to implement a stack and queue using a list data-structure.
- Take a sample of ten phishing e-mails (or any text file) and find most commonly occurring word(s)

Database Management

- Create a student table and insert data. Implement the following SQL commands on the student table:
  ALTER table to add new attributes / modify data type / drop attribute
  UPDATE table to modify data
  ORDER By to display data in ascending / descending order
  DELETE to remove tuple(s)
  GROUP BY and find the min, max, sum, count and average
- Similar exercise may be framed for other cases.
- Integrate SQL with Python by importing the MySQL module.

6. Project

The aim of the class project is to create something that is tangible and useful using Python / Python and SQL connectivity. This should be done in groups of two to three students and should be started by students at least 6 months before the submission deadline. The aim here is to find a real world problem that is worthwhile to solve.

Students are encouraged to visit local businesses and ask them about the problems that they are facing. For example, if a business is finding it hard to create invoices for filing GST claims, then students can do a project that takes the raw data (list of transactions), groups the transactions by category, accounts for the GST tax rates, and creates invoices in the appropriate format. Students can be extremely creative here. They can use a wide variety of Python libraries to create user friendly applications such as games, software for their school, software for their disabled fellow students, and mobile applications, Of course to do some of these projects, some additional learning is required; this should be encouraged. Students should know how to teach themselves.

The students should be sensitized to avoid plagiarism and violations of copyright issues while working on projects. Teachers should take necessary measures for this.

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COMPUTER SCIENCE
WITH
PYTHON
SUPPLEMENT

For the new topics introduced by **CBSE** *in the latest Syllabus issued in July, 2020*

CLASS XII

Committed to Educate the Nation

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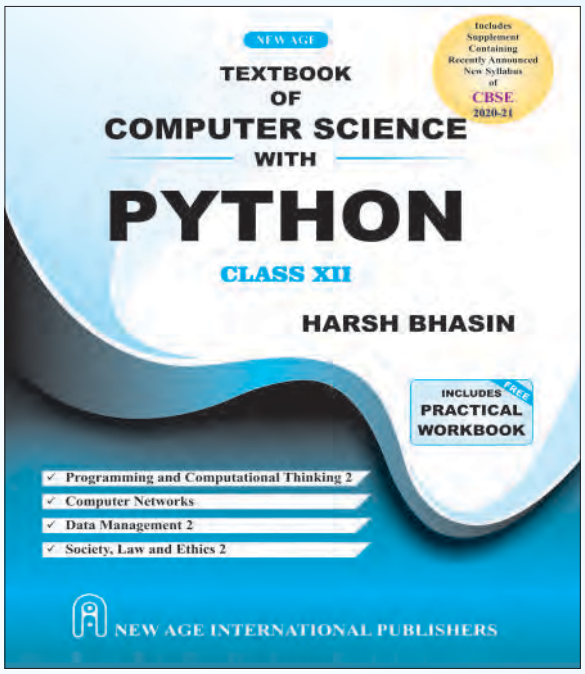

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Click Here to Buy the Book Online

Computer Science with Python Programming is a textbook designed for the students of Class XII, CBSE. It covers complete course of Computer Science. The book has been written in easy to understand language and contains ample examples. However, every attempt has been made to keep the text as precise as possible.

The code has been tested in Python 3.x on a machine with Windows 10.

Each chapter of the book includes a variety of end-chapter exercises in the form of MCQs with answers, review questions, and programming exercises to help readers test their knowledge. It may be stated here that the topics in the book have been written considering the fact that some of the readers may opt Computer Science as their career.

Key Features:

- The book has sections dedicated to Computer System and Organization to help the students to understand the basics.
- Offers in-depth treatment of topics such as Pyplot and functions.
- The book introduces Django.
- Provides points to remember and a Glossary with definitions of the key terms at the end of each chapter which will help readers to quickly recollect the important concepts.
- Questions, given at the end of each chapter and the Appendices would help students during viva and examinations.

Harsh Bhasin has done his B Tech. in Computer Science and M Tech. in Computers and is currently pursuing PhD. He qualified UGC NET in 2012 and received the Visvesvaraya Fellowship from DIETY in 2016. He was awarded the Young Researcher's Award by ErNet in 2012. Mr. Bhasin has authored a few papers, including those published in journals like *Soft Computing*. He has also authored "*Programming in C#*" (2014), "*Algorithm Analysis and Design*" (2015) and "*Theory of Computation*". He has been actively involved in research both as an author and reviewer for ACM, Pearson, Oxford University Press, Springer etc. Mr. Bhasin was the editor in chief of the special issue on "*Applicability of Soft Computing Techniques in NP Problems*," SciEp, USA.

Professionally, Mr. Bhasin is a programmer and has been involved in the development of many Enterprise Resource Planning Systems while being the proprietor of a firm based in Faridabad, Haryana, India. He has a vast industrial experience. He was an Assistant Professor in Department of Computer Science, FMIT, Jamia Hamdard. He has also taught as visiting faculty in many colleges including Delhi Technological University.

His areas of interest include Genetic Algorithms, Theory of Computation, C#, Python, Algorithms, Cellular Automata and Machine Learning.

His personal interests include Hindi poetry and Hindustani Classical Music. Mr. Bhasin is also a blogger. You can reach him at his Facebook page DTU Computation or via email at i_harsh_bhasin@yahoo.com.

Class: XII Session: 2020-21

Computer Science (083)

Sample Question Paper (Theory)

Maximum Marks: 70 **Time Allowed: 3 hours**

General Instructions:

1. This question paper contains two parts A and B. Each part is compulsory.
2. Both Part A and Part B have choices.
3. Part-A has 2 sections:
   a. Section – I is short answer questions, to be answered in one word or one line.
   b. Section – II has two case studies questions. Each case study has 4 case-based sub-parts. An examinee is to attempt any 4 out of the 5 subparts.
4. Part - B is Descriptive Paper.
5. Part- B has three sections
   a. Section-I is short answer questions of 2 marks each in which two question have internal options.
   b. Section-II is long answer questions of 3 marks each in which two questions have internal options.
   c. Section-III is very long answer questions of 5 marks each in which one question has internal option.
6. All programming questions are to be answered using Python Language only

Question No.	**Part-A**	**Marks allocated**
	Section-I **Select the most appropriate option out of the options given for each question. Attempt any 15 questions from question no 1 to 21.**	
1	Find the invalid identifier from the following a) MyName b) True c) 2ndName d) My_Name	1
2	Given the lists L=[1,3,6,82,5,7,11,92] , write the output of print(L[2:5])	1
3	Write the full form of CSV.	1
4	Identify the valid arithmetic operator in Python from the following. a) ? b) < c) ** d) and	1

5	Suppose a tuple T is declared as T = (10, 12, 43, 39), which of the following is incorrect? a) print(T[1]) b) T[2] = -29 c) print(max(T)) d) print(len(T))	1
6	Write a statement in Python to declare a dictionary whose keys are 1, 2, 3 and values are Monday, Tuesday and Wednesday respectively.	1
7	A tuple is declared as T = (2,5,6,9,8) What will be the value of sum(T)?	1
8	Name the built-in mathematical function / method that is used to return an absolute value of a number.	1
9	Name the protocol that is used to send emails.	1
10	Your friend Ranjana complaints that somebody has created a fake profile on Facebook and defaming her character with abusive comments and pictures. Identify the type of cybercrime for these situations.	1
11	In SQL, name the clause that is used to display the tuples in ascending order of an attribute.	1
12	In SQL, what is the use of IS NULL operator?	1
13	Write any one aggregate function used in SQL.	1
14	Which of the following is a DDL command? a) SELECT b) ALTER c) INSERT d) UPDATE	1
15	Name The transmission media best suitable for connecting to hilly areas.	1
16	Identify the valid declaration of L: L = [‘Mon’, ‘23’, ‘hello’, ’60.5’]	1

	a. dictionary b. string c.tuple d. list	
17	If the following code is executed, what will be the output of the following code? name="ComputerSciencewithPython" print(name[3:10])	1
18	In SQL, write the query to display the list of tables stored in a database.	1
19	Write the expanded form of Wi-Fi.	1
20	Which of the following types of table constraints will prevent the entry of duplicate rows? a) Unique b) Distinct c) Primary Key d) NULL	1
21	Rearrange the following terms in increasing order of data transfer rates. Gbps, Mbps, Tbps, Kbps, bps	1
	Section-II **Both the Case study based questions are compulsory. Attempt any 4 sub parts from each question. Each question carries 1 mark**	
22	A departmental store MyStore is considering to maintain their inventory using SQL to store the data. As a database administer, Abhay has decided that : • Name of the database - mystore • Name of the table - STORE • The attributes of STORE are as follows: ItemNo - numeric ItemName – character of size 20 Scode - numeric Quantity – numeric	

Table : STORE

ItemNo	ItemName	Scode	Quantity
2005	Sharpener Classic	23	60
2003	Ball Pen 0.25	22	50
2002	Get Pen Premium	21	150
2006	Get Pen Classic	21	250
2001	Eraser Small	22	220
2004	Eraser Big	22	110
2009	Ball Pen 0.5	21	180

(a) Identify the attribute best suitable to be declared as a primary key, 1

(b) Write the degree and cardinality of the table STORE. 1

(c) Insert the following data into the attributes ItemNo, ItemName and SCode respectively in the given table STORE.
ItemNo = 2010, ItemName = “Note Book” and Scode = 25 1

(d) Abhay want to remove the table STORE from the database MyStore. Which command will he use from the following: 1

a) DELETE FROM store;
b) DROP TABLE store;
c) DROP DATABASE mystore;
d) DELETE store FROM mystore;

(e) Now Abhay wants to display the structure of the table STORE, i.e, name of the attributes and their respective data types that he has used in the table. Write the query to display the same. 1

23 Ranjan Kumar of class 12 is writing a program to create a CSV file “user.csv” which will contain user name and password for some entries. He has written the following code. As a programmer, help him to successfully execute the given task.

```
import _____                                    # Line 1

def addCsvFile(UserName,PassWord):      # to write / add data into the CSV file
    f=open(' user.csv','_____')                 # Line 2
```

	newFileWriter = csv.writer(f) newFileWriter.writerow([UserName,PassWord]) f.close() #csv file reading code def readCsvFile(): # to read data from CSV file with open(' user.csv','r') as newFile: newFileReader = csv._____(newFile) # Line 3 for row in newFileReader: print (row[0],row[1]) newFile._____ # Line 4 addCsvFile("Arjun","123@456") addCsvFile("Arunima","aru@nima") addCsvFile("Frieda","myname@FRD") readCsvFile() #Line 5	
	(a) Name the module he should import in Line 1.	1
	(b) In which mode, Ranjan should open the file to add data into the file	1
	(c) Fill in the blank in Line 3 to read the data from a csv file.	1
	(d) Fill in the blank in Line 4 to close the file.	1
	(e) Write the output he will obtain while executing Line 5.	1
	Part – B	
	Section-I	
24	Evaluate the following expressions: a) 6 * 3 + 4**2 // 5 – 8 b) 10 > 5 and 7 > 12 or not 18 > 3	2
25	Differentiate between Viruses and Worms in context of networking and data communication threats. **OR** Differentiate between Web server and web browser. Write any two popular web browsers.	2
26	Expand the following terms: a. SMTP b. XML c. LAN d. IPR	2

27	Differentiate between actual parameter(s) and a formal parameter(s) with a suitable example for each. **OR** Explain the use of global key word used in a function with the help of a suitable example.	2
28	Rewrite the following code in Python after removing all syntax error(s). Underline each correction done in the code. Value=30 for VAL in range(0,Value) If val%4==0: print (VAL*4) Elseif val%5==0: print (VAL+3) else print(VAL+10)	2
29	What possible outputs(s) are expected to be displayed on screen at the time of execution of the program from the following code? Also specify the maximum values that can be assigned to each of the variables Lower and Upper. import random AR=[20,30,40,50,60,70]; Lower =random.randint(1,3) Upper =random.randint(2,4) for K in range(Lower, Upper +1): print (AR[K],end="#") (i) 10#40#70# (ii) 30#40#50# (iii) 50#60#70# (iv) 40#50#70#	2
30	What do you understand by Candidate Keys in a table? Give a suitable example of Candidate Keys from a table containing some meaningful data.	2

31	Differentiate between *fetchone()* and *fetchall()* methods with suitable examples for each.	2
32	Write the full forms of DDL and DML. Write any two commands of DML in SQL.	2

33	Find and write the output of the following Python code:
	
	def Display(str):
	m=""
	for i in range(0,len(str)):
	if(str[i].isupper()):
	m=m+str[i].lower()
	elif str[i].islower():
	m=m+str[i].upper()
	else:
	if i%2==0:
	m=m+str[i-1]
	else:
	m=m+"#"
	print(m)
	
	Display('Fun@Python3.0')
		2

	Section- II	
34	Write a function LShift(Arr,n) in Python, which accepts a list Arr of numbers and n is a numeric value by which all elements of the list are shifted to left. Sample Input Data of the list Arr= [10,20,30,40,12,11], n=2 Output Arr = [30,40,12,11,10,20]	3
35	Write a function in Python that counts the number of “Me” or “My” words present in a text file “STORY.TXT”. If the “STORY.TXT” contents are as follows: My first book was Me and	3

My Family. It
gave me
chance to be
Known to the
world.

The output of the function should be:

Count of Me/My in file: 4

OR

Write a function AMCount() in Python, which should read each character of a text file STORY.TXT, should count and display the occurance of alphabets A and M (including small cases a and m too).

Example:

If the file content is as follows:

Updated information
As simplified by official websites.

The EUCount() function should display the output as:

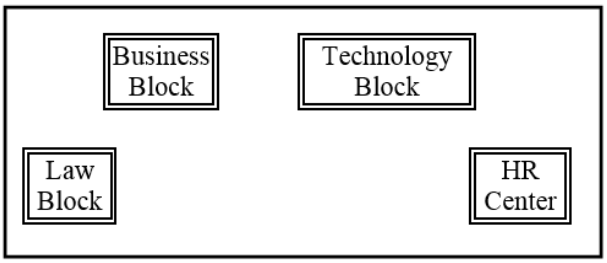
A or a:4
M or m :2

36 Write the outputs of the SQL queries (i) to (iii) based on the relations Teacher and Posting given below: 3

Table : Teacher

T_ID	Name	Age	Department	Date_of_join	Salary	Gender
1	Jugal	34	Computer Sc	10/01/2017	12000	M
2	Sharmila	31	History	24/03/2008	20000	F
3	Sandeep	32	Mathematics	12/12/2016	30000	M
4	Sangeeta	35	History	01/07/2015	40000	F
5	Rakesh	42	Mathematics	05/09/2007	25000	M
6	Shyam	50	History	27/06/2008	30000	M
7	Shiv Om	44	Computer Sc	25/02/2017	21000	M
8	Shalakha	33	Mathematics	31/07/2018	20000	F

	Table : Posting
	P_ID | Department | Place
	1 | History | Agra
	2 | Mathematics | Raipur
	3 | Computer Science | Delhi
	
	i. SELECT Department, count(*) FROM Teacher GROUP BY Department;
	ii. SELECT Max(Date_of_Join),Min(Date_of_Join) FROM Teacher;
	iii. SELECT Teacher.name,Teacher.Department, Posting.Place FROM Teachr, Posting WHERE Teacher.Department = Posting.Department AND Posting.Place=”Delhi”;	

37	Write a function in Python PUSH(Arr), where Arr is a list of numbers. From this list push all numbers divisible by 5 into a stack implemented by using a list. Display the stack if it has at least one element, otherwise display appropriate error message. **OR** Write a function in Python POP(Arr), where Arr is a stack implemented by a list of numbers. The function returns the value deleted from the stack.	3
	Section-III	
38	MyPace University is setting up its academic blocks at Naya Raipur and is planning to set up a network. The University has 3 academic blocks and one Human Resource Center as shown in the diagram below:  Center to Center distances between various blocks/center is as follows:	5

Law Block to business Block	40m
Law block to Technology Block	80m
Law Block to HR center	105m
Business Block to technology Block	30m
Business Block to HR Center	35m
Technology block to HR center	15m

Number of computers in each of the blocks/Center is as follows:

Law Block	15
Technology Block	40
HR center	115
Business Block	25

a) Suggest the most suitable place (i.e., Block/Center) to install the server of this University with a suitable reason.

b) Suggest an ideal layout for connecting these blocks/centers for a wired connectivity.

c) Which device will you suggest to be placed/installed in each of these blocks/centers to efficiently connect all the computers within these blocks/centers.

d) Suggest the placement of a Repeater in the network with justification.

e) The university is planning to connect its admission office in Delhi, which is more than 1250km from university. Which type of network out of LAN, MAN, or WAN will be formed? Justify your answer.

39 — 5

Write SQL commands for the following queries (i) to (v) based on the relations Teacher and Posting given below:

Table : Teacher

T_ID	Name	Age	Department	Date_of_join	Salary	Gender
1	Jugal	34	Computer Sc	10/01/2017	12000	M
2	Sharmila	31	History	24/03/2008	20000	F

3	Sandeep	32	Mathematics	12/12/2016	30000	M
4	Sangeeta	35	History	01/07/2015	40000	F
5	Rakesh	42	Mathematics	05/09/2007	25000	M
6	Shyam	50	History	27/06/2008	30000	M
7	Shiv Om	44	Computer Sc	25/02/2017	21000	M
8	Shalakha	33	Mathematics	31/07/2018	20000	F

Table : Posting

P_ID	Department	Place
1	History	Agra
2	Mathematics	Raipur
3	Computer Science	Delhi

i. To show all information about the teacher of History department.

ii. To list the names of female teachers who are in Mathematics department.

iii. To list the names of all teachers with their date of joining in ascending order.

iv. To display teacher's name, salary, age for male teachers only.

v. To display name, bonus for each teacher where bonus is 10% of salary.

40

A binary file "Book.dat" has structure [BookNo, Book_Name, Author, Price].

i. Write a user defined function *CreateFile()* to input data for a record and add to Book.dat .

ii. Write a function *CountRec(Author)* in Python which accepts the Author name as parameter and count and return number of books by the given Author are stored in the binary file "Book.dat"

OR

A binary file "STUDENT.DAT" has structure (admission_number, Name, Percentage). Write a function *countrec()* in Python that would read contents of the file "STUDENT.DAT" and display the details of those students whose percentage is above 75. Also display number of students scoring above 75%

5

Sample Question Paper - 2021

Computer Science – 083

MARKING SCHEME

Maximum Marks: 70 **Time Allowed: 3 hours**

	Part – A **Section - I**	
1	b) True	1
2	[6,82,5]	1
3	Comma Separated Value	1
4	c) **	1
5	b) T[2]= -29 (as tuple is immutable)	1
6	Day={1:'monday',2:'tuesday',3:'wednesday'}	1
7	30	
8	abs()	1
9	SMTP	1
10	Cyber Stalking	1
11	ORDER BY	1
12	To check if the column has null value / no value	1
13	SUM / AVG / COUNT / MAX / MIN	1
14	b) ALTER	1
15	Microwave / Radio wave	1
16	d. List	1
17	puterSc	1
18	SHOW TABLES	1
19	Wireless Fidelity	1
20	(c) Primary Key	1
21	Bps, Kbps, Mbps, Gbps, Tbps	1
	Part – A **Section - II**	
22	(a) ItemNo (b) Degree = 4 Cardinality = 7 (c) INSERT INTO store (ItemNo,ItemName,Scode) VALUES(2010, “Note Book”,25); (d) DROP TABLE store; (e) Describe Store;	1 1 1 1 1
23	(a) Line 1 : csv (b) Line 2 : a (c) Line 3 : reader (d) Line 4 : close()	1 1 1 1

	(e) Line 5 : Arjun 123@456 Arunima aru@nima Frieda myname@FRD	1
	Part – B	
24	a) 13 b) False	2
25	Viruses require an active host program or an already-infected and active operating system in order for viruses to run, cause damage and infect other executable files or documents Worms are stand-alone malicious programs that can self-replicate. **OR** **Web Browser** : A web browser is a software application for accessing information on the World Wide Web. When a user requests a web page from a particular website, the web browser retrieves the necessary content from a web server and then displays the page on the user's device. **Web Server** : A web server is a computer that runs websites. The basic objective of the web server is to store, process and deliver web pages to the users. This intercommunication is done using Hypertext Transfer Protocol (HTTP). Popular web browsers : Google Chrome, Mozilla Firefox, Internet Explorer etc	2
26	a. SMTP - Simple Mail Transfer Protocol b. XML - eXtensible Markup Language c. LAN – Local Area Network d. IPR – Intellectual Property Rights	2
27	The list of identifiers used in a function call is called actual parameter(s) whereas the list of parameters used in the function definition is called formal parameter(s). Actual parameter may be value / variable or expression. Formal parameter is an identifier. Example: def area(side): # line 1 return side*side; print(area(5)) # line 2 In line 1, side is the formal parameter and in line 2, while invoking area() function, the value 5 is the actual parameter.	2

	A formal parameter, i.e. a parameter, is in the *function definition*. An actual parameter, i.e. an argument, is in a *function call*.
	OR
	Use of global key word:
	In Python, global keyword allows the programmer to modify the variable outside the current scope. It is used to create a global variable and make changes to the variable in local context. A variable declared inside a function is by default local and a variable declared outside the function is global by default. The keyword global is written inside the function to use its global value. Outside the function, global keyword has no effect.
	Example
	c = 10 # global variable
	def add():
	global c
	c = c + 2 # global value of c is incremented by 2
	print("Inside add():", c)
	
	add()
	c=15
	print("In main:", c)
	
	output:
	Inside add() : 12
	In main: 15	

28	**CORRECTED CODE:**
	Value=30
	for VAL in range(0,Value) : # Error 1
	if val%4==0: # Error 2
	print (VAL*4)
	elif val%5==0: # Error 3
	print (VAL+3)
	else: # Error 4
	print(VAL+10)
		2

29	OUTPUT: (ii) Maximum value of Lower: 3 Maximum value of Upper: 4	2
30	A table may have more than one such attribute/group of attributes that identifies a tuple uniquely, all such attribute(s) are known as Candidate Keys.	2

Table:Item

Ino	Item	Qty
I01	Pen	500
I02	Pencil	700
I04	CD	500
I09		700
I05	Eraser	300
I03	Duster	200

In the above table Item, ItemNo can be a candidate key

31 fetchall() fetches all the rows of a query result. An empty list is returned if there is no record to fetch the cursor. — 2

fetchone() method returns one row or a single record at a time. It will return None if no more rows / records are available.

Any example.

32 DDL – Data Definition Language — 2

DML – Data Manipulation Language

Any two out of INSERT, DELETE, UPDATE

33 OUTPUT : **fUNnpYTHON** — 2

34 — 3

```
def LShift(Arr,n):
    L=len(Arr)
    for x in range(0,n):
        y=Arr[0]
        for i in range(0,L-1):
            Arr[i]=Arr[i+1]
        Arr[L-1]=y
    print(Arr)
```

Note : Using of any correct code giving the same result is also accepted.

35 — 3

```
def displayMeMy():
    num=0
    f=open("story.txt","rt")
    N=f.read()
    M=N.split()
    for x in M:
        if x=="Me" or x== "My":
            print(x)
            num=num+1
    f.close()
    print("Count of Me/My in file:",num)
```

OR

```
def count_A_M():
    f=open("story.txt","r")
    A,M=0,0
    r=f.read()
    for x in r:
        if x[0]=="A" or x[0]=="a" :
            A=A+1
        elif x[0]=="M" or x[0]=="m":
            M=M+1
    f.close()
    print("A or a: ",A)
    print("M or m: ",M)
```

Note : Using of any correct code giving the same result is also accepted.

36 **OUTPUT:** 3

i.

Department	Count(*)
History	3
Computer Sc	2
Mathematics	3

ii. Max - 31/07/2018 or 2018-07-31 Min- 05/09/2007 or 2007-09-05

iii.

name	Department	Place
Jugal	Computer Sc	Delhi
Shiv Om	Computer Sc	Delhi

37 **ANSWER: (Using of any correct code giving the same result is also accepted.)** 3

```
def PUSH(Arr,value):
    s=[]
    for x in range(0,len(Arr)):
        if Arr[x]%5==0:
            s.append(Arr[x])
    if len(s)==0:
```

```
        print("Empty Stack")
    else:
        print(s)
```

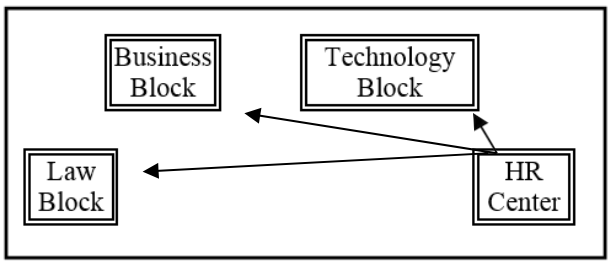
OR

```
def popStack(st) :
    # If stack is empty
    if len(st)==0:
        print("Underflow")
    else:
        L = len(st)
        val=st[L-1]
        print(val)
        st.pop(L-1)
```

38 | 5

a. Most suitable place to install the server is HR center, as this center has maximum number of computers.

b.



c. Switch

d. Repeater may be placed when the distance between 2 buildings is more than 70 meter.

e. WAN, as the given distance is more than the range of LAN and MAN.

39 | 5

i. SELECT * FROM teacher WHERE department= “History”;

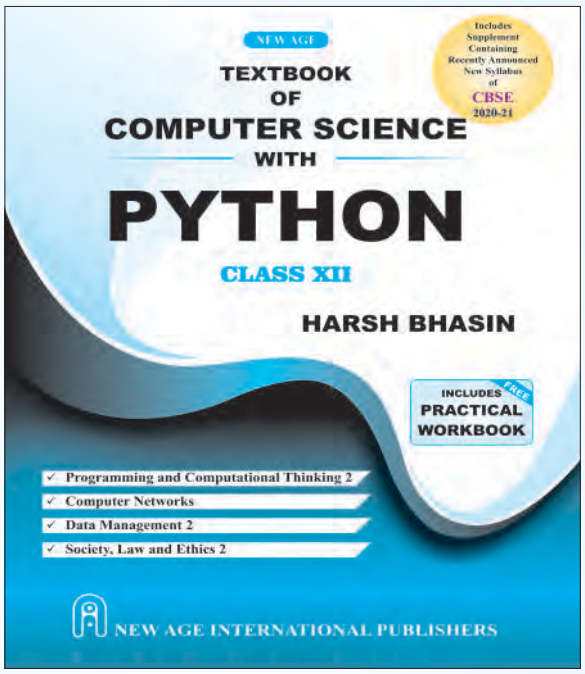
ii. SELECT name FROM teacher WHERE department= “Mathematics” AND gender= “F”;

iii. SELECT name FROM teacher ORDER BY date_of_join;

iv. SELECT name, salary, age FROM teacher WHERE gender=’M’;

v. SELECT name, salary*0.1 AS Bonus FROM teacher;

40	**ANSWER: (Using of any correct code giving the same result is also accepted.)**
	
	import pickle
	def createFile():
	  fobj=open("Book.dat","ab")
	  BookNo=int(input("Book Number : "))
	  Book_name=input("Name :")
	  Author = input("Author: ")
	  Price = int(input("Price : "))
	  rec=[BookNo,Book_Name,Author,Price]
	  pickle.dump(rec,fobj)
	  fobj.close()
	
	def CountRec(Author):
	  fobj=open("Book.dat","rb")
	  num = 0
	  try:
	  while True:
	  rec=pickle.load(fobj)
	  if Author==rec[2]:
	  num = num + 1
	  except:
	  fobj.close()
	  return num
	
	OR
	
	import pickle
	def CountRec():
	  fobj=open("STUDENT.DAT","rb")
	  num = 0
	  try:
	  while True:
	  rec=pickle.load(fobj)
	  if rec[2] > 75:
	  print(rec[0],rec[1],rec[2],sep="\t")
	  num = num + 1
	  except:
	  fobj.close()
	  return num
		5



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Computer Science with Python Programming is a textbook designed for the students of Class XII, CBSE. It covers complete course of Computer Science. The book has been written in easy to understand language and contains ample examples. However, every attempt has been made to keep the text as precise as possible.

The code has been tested in Python 3.x on a machine with Windows 10.

Each chapter of the book includes a variety of end-chapter exercises in the form of MCQs with answers, review questions, and programming exercises to help readers test their knowledge. It may be stated here that the topics in the book have been written considering the fact that some of the readers may opt Computer Science as their career.

Key Features:

- The book has sections dedicated to Computer System and Organization to help the students to understand the basics.
- Offers in-depth treatment of topics such as Pyplot and functions.
- The book introduces Django.
- Provides points to remember and a Glossary with definitions of the key terms at the end of each chapter which will help readers to quickly recollect the important concepts.
- Questions, given at the end of each chapter and the Appendices would help students during viva and examinations.

Harsh Bhasin has done his B Tech. in Computer Science and M Tech. in Computers and is currently pursuing PhD. He qualified UGC NET in 2012 and received the Visvesvaraya Fellowship from DIETY in 2016. He was awarded the Young Researcher's Award by ErNet in 2012. Mr. Bhasin has authored a few papers, including those published in journals like *Soft Computing*. He has also authored "*Programming in C#*" (2014), "*Algorithm Analysis and Design*" (2015) and "*Theory of Computation*". He has been actively involved in research both as an author and reviewer for ACM, Pearson, Oxford University Press, Springer etc. Mr. Bhasin was the editor in chief of the special issue on "*Applicability of Soft Computing Techniques in NP Problems*," SciEp, USA.

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