VISHVAS ®

MOCK TEST-2022

COMPUTER SCIENCE

WITH CBSE SAMPLE PAPER

As per the CBSE Revised Rationalized Curriculum of Computer Science code (083)
and Circular No. Acad-51 Dt. 5.7.2021, Acad-53 Dt. 22.7.2021 &
Circular no. Acad-07/2022 Dt. 14-01-22 for session 2021-2022

Includes :
- **CBSE Sample Paper 2021-2022 (Term– 2)**
- **CBSE Marking Scheme**
- **Practice Paper(Solved) (1-3)**
- **Mock Test (I & II)**

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FOR **CBSE**

XII
Term–2

**Mock Test Based on
CBSE Sample Paper Term–2
issued by CBSE on Dt. 14.01.2022**

COMPLIMENTARY COPY
COMPUTER SCIENCE (083) CLASS-XII

Contents

- **CBSE Sample Paper 2021-22 (Term-II)**

- **CBSE Marking Scheme**

- **Sample Paper 2021-22 (1-3)**

- **Mock Test (I & II)**

- *Answers of Mock Test will be discussed by the author 10 days before the examination through the Webinar.*

In spite of our sincere efforts, there might have crept in some deficiencies in the preparation of this book for which the Authors and Publisher should not be held responsible. However, constructive suggestions for further improvement of this book will be highly appreciated and looked forward in our subsequent editions. **For latest update in syllabus and marking scheme visit : www.cbse.nic.in**

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Curriculum
Computer Science
CLASS-XII (083) 2021-22(Term-II)

1. Prerequisites
Computer Science- Class XI

2. Learning Outcomes
Student should be able to
a) apply the concept of function.
b) explain and use the concept of file handling.
c) use basic data structure: Stacks.
d) explain basics of computer networks.
e) use Database concepts, SQL along with connectivity between Python and SQL.

3. Distribution of Marks:

Unit No.	Unit Name	Marks	Period	
			Theory	Practical
I	Computational Thinking and Programming - 2	40	50	25
II	Computer Networks	10	10	–
III	Database Management	20	20	15
	Total	70	80	40

Unit	Unit Name	Term–1	Term–2
I	Computational Thinking and Programming - 2	35	5
II	Computer Networks	–	10
III	Database Management	–	20
	Total	35	35

4. Unit wise Syllabus
TERM 2:
Unit I: Computational Thinking and Programming – 2
- Data Structure: Stack, operations on stack (push & pop), implementation of stack using list.

Unit II: Computer Networks

- Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)

- Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching)

- Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves.

- Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)

- Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)

- Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP

- Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), 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: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key)

- Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command

- Aggregate functions (max, min, avg, sum, count), group by, having clause, joins : Cartesian product on two tables, equi-join and natural join

- Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications

5. Practical

S. No		Marks (Total 30)	Term-1 (15 Marks)	Term-2 (15 Marks)
1	**Lab Test:** 1. Python program	8	6	2
	2. 3 SQL Queries based on one/two table(s), 2 output questions based on SQL queries	4	–	4
2	Report file: Term – 1 : Minimum 15 Python programs based on Term – 1 Syllabus Term – 2 : • Minimum 3 Python programs based on Term-2 Syllabus • SQL Queries – Minimum 5 sets using one table / two tables. • Minimum 2 programs based on Python - SQL connectivity.	7	4	3
3	Project (using concepts learnt in Classes 11 and 12) Term – 1 : Synopsis of the project to be submitted by the students (documentation only, may not submit the code during Term - 1) Term - 2 : Final coding + Viva voce (Student will be allowed to modify their Term 1 document and submit the final executable code.)	8	3	5
4	Viva voce	3	2	1

6. Suggested Practical List:
Term-2
Python Programming

• Write a Python program to implement a stack using list.

Database Management

• Create a student table and insert data. Implement the following SQL commands on the student table:
  - o ALTER table to add new attributes / modify data type / drop attribute
  - o UPDATE table to modify data
  - o ORDER By to display data in ascending / descending order
  - o DELETE to remove tuple(s)

- o   GROUP BY and find the min, max, sum, count and average
- o   Joining of two tables.
- Similar exercise may be framed for other cases.
- Integrate SQL with Python by importing suitable module.

PROJECT

The aim of the class project is to create something that is tangible and useful using Python file handling/ Python-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 sensitised to avoid plagiarism and violations of copyright issues while working on projects. Teachers should take necessary measures for this.

ABOUT THE AUTHOR

Harpreet Malvai has been teaching Computer Science for more than two decades in some of the top schools in India, including Maharani Gayatri Devi School, Jaipur and Carmel Convent School, Chandigarh. She is MSc, M.C.A and honours graduate from the Advanced Centre for Mathematics, Panjab University, Chandigarh. She has done specialization courses in **'Data Science in Python'** and **'Applied Data Visualization in Python'** from University of Michigan (USA). She has also done **'Python for Data Science, Artificial Intelligence and Development'** and **'What is Data Science?'** from IBM. Along with these technical courses she has successfully done a course in writing from University of California, Berkeley (USA).

She is the director of a foundation for inclusivity in education and has been felicitated by the CBSE for her contribution to education through outreach programmes. In her teaching career the endeavour has been to reach to all levels of learners at their level and her students have performed well consistently. Some of her students have topped the CBSE board in her subject, in fact one year, two toppers out of the five toppers of the board were her students.

ABOUT THE BOOKS
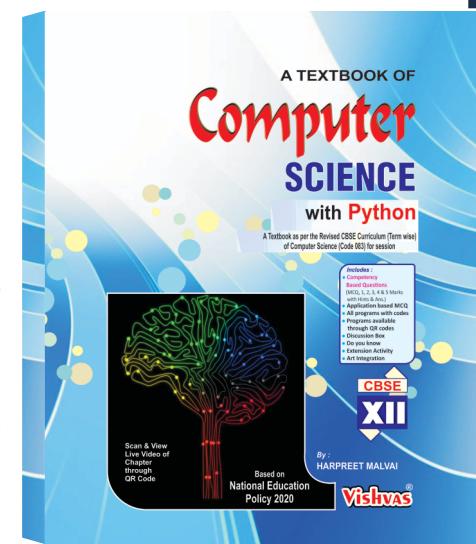
THE TEXTBOOK OF COMPUTER SCIENCE(083) FOR CLASS XI AND XII
BY HARPREET MALVAI

The two books are published based on the latest complete syllabus of Computer Science with Python (Code No. 083) issued by the Central Board of Secondary Education for Classes XI and XII.

The books will make the subject really easy and fun to learn.

The highlights of class XII book:

- All concepts are explained in a simple language, in detail and with examples.
- All questions are answered, program codes are worked out.
- There are case studies which are also explained and program codes are given.
- The book provides QR codes and links for programs so you can use your phone to check and execute the program code without downloading any software.
- The book is also complemented by QR code which features the chapters from the book in 15-18-minute videos.
- The book has complete projects with working codes.

CBSE SAMPLE QUESTION PAPER
COMPUTER SCIENCE (083) SESSION 2021-22
Class XII (TERM-II)

Time allowed: 2 hours   Maximum Marks: 35

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

(SECTION A)

Each question carries 2 marks

Q1.   Give any two characteristics of stacks.   (2)

Q2.   (i)   Expand the following: (1)

        `SMTP,    XML`

    (ii)   Out of the following, which is the fastest wired and wireless medium of transmission?   (1)

        `Infrared, coaxial cable, optical fibre, microwave, Ethernet cable`

Q3.   Differentiate between char(n) and varchar(n) data types with respect to databases.   (2)

Q4.   A resultset is extracted from the database using the cursor object (that has been already created)
    by giving the following statement.   (2)

    `Mydata=cursor.fetchone()`

    (a)   How many records will be returned by fetchone() method?

    (b)   What will be the datatype of Mydata object after the given command is executed?

Q5.   Write the output of the queries (a) to (d) based on the table, Furniture given below: (2)

Table: FURNITURE

FID	NAME	DATEOFPURCHASE	COST	DISCOUNT
B001	Double Bed	03-Jan-2018	45000	10
T010	Dining Table	10-Mar-2020	51000	5
B004	Single Bed	19-Jul-2021	22000	0
C003	Long Back Chair	30-Dec-2016	12000	3
T006	Console Table	17-Nov-2019	15000	12
B006	Bunk Bed	01-Jan-2021	28000	14

(a) `SELECT SUM(DISCOUNT) FROM FURNITURE WHERE COST>15000;`

(b) `SELECT MAX(DATEOFPURCHASE) FROM FURNITURE;`

(c) `SELECT * FROM FURNITURE WHERE DISCOUNT>5 AND FID LIKE "T%";`

(d) `SELECT DATEOFPURCHASE FROM FURNITURE WHERE NAME IN ("Dining Table", "Console Table");`

Q6.　(i)　Which command is used to view the list of tables in a database? 　　　　　(1)

　　(ii)　Give one point of difference between an equi-join and a natural join. 　　　(1)

Q7.　Consider the table, **MOVIEDETAILS** given below: 　　　　　　　　　　(2)

Table: MOVIEDETAILS

MOVIEID	TITLE	LANGUAGE	RATING	PLATFORM
M001	Minari	Korean	5	Netflix
M004	MGR Magan	Tamil	4	Hotstar
M010	Kaagaz	Hindi	3	Zee5
M011	Harry Potter and the Chamber of Secrets	English	4	Prime Video
M015	Uri	Hindi	5	Zee5
M020	Avengers: Endgame	English	4	Hotstar

(a)　Identify the degree and cardinality of the table.

(b)　Which field should be made the primary key? Justify your answer.

OR

(a)　Identify the candidate key(s) from the table **MOVIEDETAILS**.

(b)　Consider the table **SCHEDULE** given below:

Table: SCHEDULE

SLOTID	MOVIEID	TIMESLOT
S001	M010	10 AM to 12 PM
S002	M020	2 PM to 5 PM
S003	M010	6 PM to 8 PM
S004	M011	9 PM to 11 PM

Which field will be considered as the foreign key if the tables **MOVIEDETAILS** and **SCHEDULE** are related in a database?

(SECTION B)

Each question carries 3 marks

Q8.   Julie has created a dictionary containing names and marks as key value pairs of 6 students. Write a program, with separate user defined functions to perform the following operations: (3)

- Push the keys (name of the student) of the dictionary into a stack, where the corresponding value (marks) is greater than 75.

- Pop and display the content of the stack.

For example:

If the sample content of the dictionary is as follows:

```
R={"OM":76, "JAI":45, "BOB":89, "ALI":65, "ANU":90, "TOM":82}
```

The output from the program should be:

```
TOM ANU BOB OM
```

OR

Alam has a list containing 10 integers. You need to help him create a program with separate user defined functions to perform the following operations based on this list.

- Traverse the content of the list and push the even numbers into a stack.

- Pop and display the content of the stack.

For Example:

If the sample Content of the list is as follows:

```
N=[12, 13, 34, 56, 21, 79, 98, 22, 35, 38]
```

Sample Output of the code should be:

```
38 22 98 56 34 12
```

Q9.   (i)   A table, `ITEM` has been created in a database with the following fields: (1)

```
ITEMCODE, ITEMNAME, QTY, PRICE
```

   Give the SQL command to add a new field, `DISCOUNT` (of type Integer) to the `ITEM` table.

   (ii)   Categorize following commands into DDL and DML commands?   (2)

```
INSERT INTO, DROP TABLE, ALTER TABLE, UPDATE...SET
```

Q10.   Charu has to create a database named **MYEARTH** in **MYSQL.** She now needs to create a table named **CITY** in the database to store the records of various cities across the globe. The table **CITY** has the following structure: (3)

Table: CITY

FIELD NAME	DATA TYPE	REMARKS
CITYCODE	CHAR(5)	Primary Key
CITYNAME	CHAR(30)	
SIZE	INTEGER	
AVGTEMP	INTEGER	
POLLUTIONRATE	INTEGER	
POPULATION	INTEGER	

Help her to complete the task by suggesting appropriate SQL commands.

(SECTION C)

Each question carries 4 marks

Q11. Write queries (a) to (d) based on the tables EMPLOYEE and DEPARTMENT given below: (4)

Table: EMPLOYEE

EMPID	NAME	DOB	DEPTID	DESIG	SALARY
120	Alisha	23-Jan-1978	D001	Manager	75000
123	Nitin	10-Oct-1977	D002	AO	59000
129	Navjot	12-Jul-1971	D003	Supervisor	40000
130	Jimmy	30-Dec-1980	D004	Sales Rep	
131	Faiz	06-Apr-1984	D001	Dep Manager	65000

Table: DEPARTMENT

DEPTID	DEPTNAME	FLOORNO
D001	Personal	4
D002	Admin	10
D003	Production	1
D004	Sales	3

(a)   To display the average salary of all employees, department wise.

(b)   To display name and respective department name of each employee whose salary is more than 50000.

(c)   To display the names of employees whose salary is not known, in alphabetical order.

(d)   To display **DEPTID** from the table **EMPLOYEE** without repetition.

Q12. (i)   Give two advantages and two disadvantages of star topology   (2)

<div align="center">OR</div>

Define the following terms:

```
www , web hosting
```

(ii)   How is packet switching different from circuit switching?   (2)

Q13. BeHappy Corporation has set up its new centre at Noida, Uttar Pradesh for its office and web-based activities. It has 4 blocks of buildings.   (4)

Distance between the various blocks is as follows:

A to B	40 m
B to C	120m
C to D	100m
A to D	170m
B to D	150m
A to C	70m

BeHappy Corporation

Block A   Block B
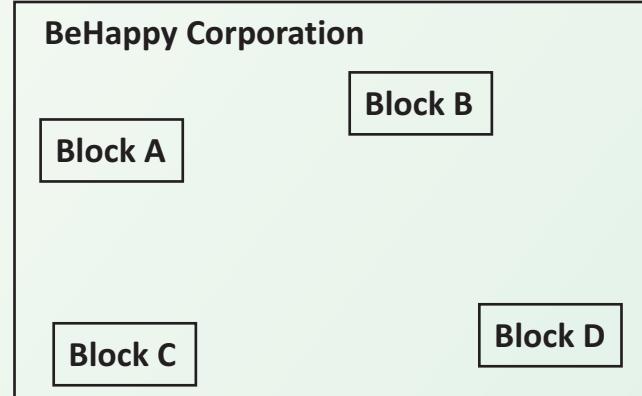
Block C   Block D

Numbers of computers in each block

Block A - 25

Block B - 50

Block C - 125

Block D - 10

(a)   Suggest and draw the cable layout to efficiently connect various blocks of buildings within the Noida centre for connecting the digital devices.

(b)   Suggest the placement of the following device with justification

i.   Repeater

ii.   Hub/Switch

(c)   Which kind of network (PAN/LAN/WAN) will be formed if the Noida office is connected to its head office in Mumbai?

(d)   Which fast and very effective wireless transmission medium should preferably be used to connect the head office at Mumbai with the centre at Noida?

MARKING SCHEME
COMPUTER SCIENCE (CODE-083)
CLASS XII TERM-II SESSION 2021-22

Time allowed: 2 hours　　　　　　　　　　　　　　　　　　　　　　　　Maximum Marks: 35
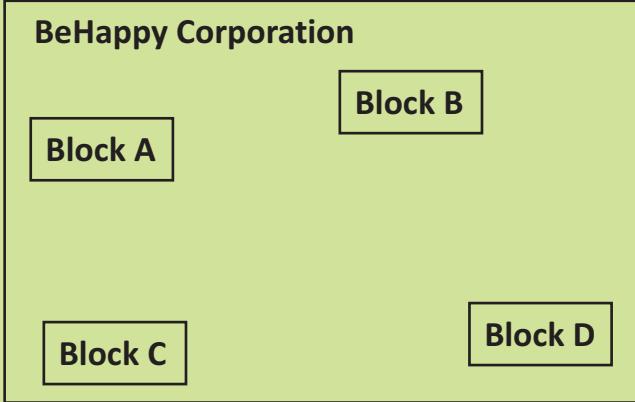
General instructions:

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- *Section C, consists of 3 questions (11-13). Each question carries 4 marks.*
- *Internal choices have been given for question numbers 7, 8 and 12.*

		Section -A Each question carries 2 marks		
Q. No	Part No.	Question	Marking Instructions	Marks
1.		Characteristics of Stacks: ● It is a LIFO data structure ● The insertion and deletion happens at one end i.e. from the top of the stack	1 mark for each point	(2)
2.	(i)	SMTP : Simple Mail Transfer Protocol XML: Extensible Mark Up Language	½ mark for each correct expansion	(1)
	(ii)	Wired- optical fibre Wireless – microwave	½ mark for each correct answer	(1)
3.		char(n): ● stores a fixed length string between 1 and 255 ● if the value is of smaller length, adds blank spaces ● some space is wasted varchar(n) : ● stores a variable length string ● no blanks are added even if value is of smaller length ● no wastage of space	1 mark for each correct difference (minimum 2 differences to be given)	(2)
4.		(a) One record (b) tuple	1 mark for each correct answer	(2)

5.		(a) 29 (b) 19-Jul-2021 (c)	T006	Console Table	17-Nov-2019	15000	12 | (d) 10-Mar- 2020 17-Nov-2019	½ mark for each correct output	(2)
6.	(i)	SHOW TABLES;	1 mark for correct answer	(1)
	(ii)	Equi- join: ● The join in which columns from two tables are compared for equality ● Duplicate columns are shown Natural Join ● The join in which only one of the identical columns existing in both tables is present ● No duplication of columns	1 mark for correct difference (Any one point may be given)	(1)
7.		(a) Degree: 5 Cardinality: 6	½ mark each for correct degree and cardinality	
		(b) MOVIEID should be made the primary key as it uniquely identifies each record of the table. OR (a) MOVIEID and TITLE (b) MOVIEID	½ mark for correct field and ½ mark for justification ½ mark for each correct field name 1 mark for correct answer	(2)

SECTION – B
Each question carries 3 marks

| 8. | | ```# Question No 8 (first option)
R={"OM":76, "JAI":45, "BOB":89,
"ALI":65, "ANU":90, "TOM":82}
def PUSH(S,N):
   S.append(N)
def POP(S):
   if S!=[]:
     return S.pop()
   else:``` | 1 mark for correct PUSH operation | |

```
              return None
ST=[]
for k in R:
   if R[k]>=75:
      PUSH(ST,k)
while True:
   if ST!=[]:
      print(POP(ST),end=" ")
   else:
      break

                    OR

# Question No 8 (second option)
N=[12, 13, 34, 56, 21, 79, 98, 22, 35, 38]
def PUSH(S,N):
   S.append(N)
def POP(S):
   if S!=[]:
      return S.pop()
   else:
      return None
ST=[]
for k in N:
   if k%2==0:
      PUSH(ST,k)
while True:
   if ST!=[]:
      print(POP(ST),end=" ")
   else:
      break
```

		return None ... (above)	1 mark for correct POP operation 1 mark for correct function calls and displaying the output	(3)
			1 mark for correct PUSH operation 1 mark for correct POP operation 1 mark for correct function calls and displaying the output	
			Note: Marks to be awarded for any other correct logic given by the student	
9.	(i)	`ALTER TABLE Item` `ADD (Discount INT);`	1 mark for correct command	(1)
	(ii)	DDL: DROP TABLE, ALTER TABLE DML: INSERT INTO, UPDATE...SET	½ mark for each correct command identified	(2)

| | | ```
CREATE DATABASE MYEARTH;

CREATE TABLE CITY
(
    CITYCODE CHAR(5) PRIMARY KEY,
    CITYNAME CHAR(30),
    SIZE INT,
    AVGTEMP INT,
    POPULATIONRATE INT,
    POPULATION INT,
);
``` | 1 mark for correctly creating database.<br><br>2 marks for correctly creating the table. | (3) |
| | | **SECTION – C**
Each question carries 4 marks | | |
| 11. | | (a) ```SELECT AVG(SALARY)
    FROM EMPLOYEE GROUP BY DEPTID;```
(b) ```SELECT NAME, DEPTNAME
    FROM EMPLOYEE, DEPARTMENT
    WHERE
        EMPLOYEE.DEPTID=
            DEPARTMENT.DEPTID
        AND SALARY>50000;```
(c) ```SELECT NAME FROM EMPLOYEE
    WHERE SALARY IS NULL
    ORDER BY NAME;```
(d) ```SELECT DISTINCT DEPTID
    FROM EMPLOYEE;``` | 1 mark for each correct query | (4) |
| 12. | (i) | Advantages
• Ease of service
• Centralized control
• Easy to diagnose faults
• One device per connection

Disadvantages
• long cable length
• difficult to expand
• central node dependency

OR

www: a set of protocols that allow you to access any document on the internet through the naming systems based on URLs

Web hosting: Web hosting is a service that allows organizations and individuals to post a website or web page onto the server, which can be viewed by everyone on the Internet. | ½ mark for each correct advantage / disadvantage

1 mark for each correct definition | (2) |

	(ii)	Packet switching: ● uses store and forward concept to send messages ● no physical path is actually establishes ● message is divided into smaller parts, known as packets and then sent forward ● tight upper limit on block size ● Each data unit knows only the final receiver's address Circuit switching ● physical connection is established between sender and receiver ● Each data unit knows the entire path from sender to receiver ● It does not follow store and forward concept	1 mark for each correct difference (minimum two points should be given)	(2)
13.		(a) BeHappy Corporation Block B Block A Block C Block D (b) Repeater : between C and D as the distance between them is 100 mts. Hub/ Switch : in each block as they help to share data packets within the devices of the network in each block (c) WAN. (d) Satellite	1 mark for each correct answer	(4)

PRACTICE PAPER–1(SOLVED)
COMPUTER SCIENCE (083)

Time allowed: 2 hours   Maximum Marks: 35

General instructions:

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

(SECTION A)
Each question carries 2 marks

Q1. **Give any two characteristics of queues.** (2)

Ans. Characteristics of queues:
- It is a FIFO data structure
- The insertion takes place at the end and using append( ) and deletion takes place from the first/beginning of the queue using pop(0).

Q2. **(i) Expand the following:** (1)
   ```
   PPP , POP3
   ```
   (ii) Out of the following, which is the fastest wired and wireless medium of transmission? (1)
   ```
   Twisted Pair Cable, Coaxial cable, opticalfibre, Radio wave,
   Ethernet cable.
   ```

Ans. (i) Point to Point Protocol, Post Office Protocol 3
   (ii) Cheapest Transmission medium: Twisted Pair Cable
   Fastest Transmission medium : Radio wave

Q3. **Name 4 Data types used to store Numeric data in Databases?** (1)

Ans. INT/INTEGER, SMALLINT, DEC/DECIMAL, FLOAT

Q4. **A resultset is extracted from the Customer table using the cursor object (that has been already created) by giving the following statement.**

   Rec_Data=cursor.fetchall()

   (a) How many records of the table will be returned by fetchall() method?

   (b) What will be the datatype of Rec_Data object after the given command is executed?

Ans. (a) In case the table has records then all the records will be returned as a list of tuples, otherwise it will return an empty list.

   (b) List of tuples

Q5. **Write the output of the queries (a) to (d) based on the table Sportstars, given below:** (2)

Table: Sportstars

Admn_No	Name	DOB	Sport	Medals	Class
V1237	Vanshika	2005-02-19	Tennis	3	11
S1432	Ruhaani	2005-09-11	Football	5	12
SM1781	Aalam	2005-07-01	Cricket	4	11
V1935	Manan	2005-04-07	Football	6	11
S1276	Aarav	2005-10-06	Tennis	4	12
SM1872	Rehaan	2004-12-11	Football	3	12

a) SELECT COUNT(*) FROM Sportstars WHERE Medals>=4;

b) SELECT SUM(Medals) FROM Sportstars WHERE Class=12;

c) SELECT MAX(DOB) FROM Sportstars;

d) SELECT DOB FROM Sportstars WHERE Admn_No LIKE "SM%"

Ans. a) 4   b) 12   c) 2005-10-06   d)

2005-07-01
2005-04-07

Q6. (i) **Which command deletes an entire table, a view of a table or other objects in the database?** (1)

(ii) **What are SQL Joins?** (1)

Ans. (i) DROP TABLE tablename

(ii) The SQL Joins are used to combine records from two or more tables in a database. A JOIN is a means for combining fields from two tables by using values common to each.

Q7. **Consider the Table Customers given below:** (2)

ID	Name	Age	City	Salary
1	Kashika	37	Jammu	80000.00
2	Anupriya	35	Shimla	75000.00
3	Vijayan	36	Hyderabad	65000.00
4	Krishnan	35	Chennai	55000.00
5	Harsh	37	Gandhinagar	85000.00
6	Raisa	32	Mumbai	45000.00
8	Clifford	36	Chennai	65000.00
9	Jaisha	36	Mumbai	85000.00
10	Aseem	37	Hyderabad	75000.00
11	Shona	35	Hyderabad	65000.00
12	Manan	38	Jammu	60000.00

(a) Identify the degree and cardinality of the table.

(b)　Which field should be made the primary key? Justify your answer.

Ans.　(a) Degree: 5 Cardinality: 11

(b) The field ID should be made the primary key as it uniquely identifies each record of the table.

SECTION – B
Each question carries 3 marks

Q.8　Write a function in Python ENQ(Evenlist), where Evenlist is a list of numbers, from which we will enqueue all the even numbers into a queue implemented by using a list. Display the queue if it has at least one element, otherwise display appropriate error message.　(3)

Ans.
```
def ENQ(Evenlist):
    qlist=[]
    for element in Evenlist:
        if element%2==0:
            qlist.append(element)
    if len(qlist)>0:
        return qlist
    else:
        return "Underflow Error:Stack is Empty"
```

Q9.　(i)　A table, SPORTSTARS has been created in a database with the following fields:　(3)

Admn_No, Name, DOB, Sport, Medals, Class

Give the SQL command to rename the field Class to Grade in this table.

(ii)　Which of the following is a DDL command?

DELETE FROM, DROP TABLE, CREATE TABLE, INSERT INTO

Ans.　(i)　ALTER TABLE sportstars RENAME COLUMN Class TO Grade;

(ii)　DDL: DROP TABLE, CREATE TABLE

Q10.　Golden Tulips is using MySQL to create a database called STUDENTDETAILS with a table Student which the following structure. Write the SQL commands for doing the same.　(3)

Field	Data Type	Remarks	NULL
StudentID	char(10)	Primary Key	NO
NAME	varchar(30)		NO
DOB	date		NO
CITY	varchar(30)		YES
MARKS	int		YES
Email	varchar(30)		YES

Ans.　The SQL commands are:

```
CREATE DATABASE STUDENTDETAILS;

CREATE TABLE Student(StudentID CHAR(10) PRIMARY KEY,NAME VARCHAR(30)
NOT NULL,DOB date NOT NULL, CITY VARCHAR(30),MARKS INTEGER);
```

(SECTION C)
Each question carries 4 marks

Q11. **Write SQL commands for the queries (a)-(d) based on the two tables TAXITYPE and TRAVEL**   (4)

TABLE: TAXITYPE

TAXI_CODE	TAXITYPE	PERKM
T01	TEMPO TRAVELLER	40
T02	AC INNOVA	20
T03	AC ERTIGA	15
T04	AC HATCHBACK	10
T05	AC SEDAN	10

TABLE: TRAVEL

CNO	CNAME	TRAVELDATE	KM	TAXI_CODE	NOP
101	Randeep Singh	2018-11-07	200	T01	12
102	Sharad Bali	2018-12-21	120	T04	4
105	Sangeeta M	2019-04-25	450	T01	15
103	Manish Nagpal	2019-01-29	280	T02	5
107	Veronica Masih	2019-03-12	365	T04	2
104	Dinesh Hoon	2019-10-28	290	T05	4
106	Ramita Malik	2019-04-06	100	T01	20

a) To display CNO, CNAME, TRAVELDATE from the table TRAVEL in descending order of CNO.

b) To display the CNAME of all customers from the table TRAVEL who are travelling by vehicle with code T01 or T02

c) To display the CNO and CNAME of those customers from the table TRAVEL who travelled between '2019-01-06' and '2019-05-01'.

d) To display all the details from table TRAVEL for the customers, who have travel distance more than 250 KM in ascending order of NOP (Number of Passengers)

Ans. a)   SELECT CNO, CNAME, TRAVELDATE FROM TRAVEL ORDER BY CNO DESC;

b)   SELECT CNAME FROM TRAVEL WHERE TAXI_CODE= 'T01' OR TAXI_CODE = 'T02';

OR

SELECT CNAME FROM TRAVEL TAXI_CODE IN ('T01', 'T02');

c) SELECT CNO, CNAME from TRAVEL WHERE TRAVELDATE >='2019-01-06' AND TRAVELDATE<='2019-05-01';

OR

SELECT CNO, CNAME FROM TRAVEL. WHERE TRAVEL DATE BETWEEN '2019-01-06' AND 2019-05-01':

d) SELECT* FROM TRAVEL WHERE KM >250 ORDER BY NOP;

Q12. **(i)** **Give two advantages and two disadvantages of bus topology** (4)

OR

Define the following terms:

```
Bandwidth, IP address
```

(ii) **How are Radio Waves and Microwaves different?**

Ans. (i)

Bus Topology	
Advantages	**Disadvantages**
1. Easy to install and is used for small networks. 2. Media requirements low. 3. One node failing does not affect the network functioning.	1. Fails if central line fails. 2. Single communication channel can slow down the access time. 3. High network traffic can slow down the speed.

OR

Bandwidth: The amount of data that can be transferred over a network in a specific amount of time is termed as Bandwidth. It is expressed as a bitrate and measured in bits per second (bps), Mbps and Gbps.

IP address (internet protocol address) is a standard numerical representation that uniquely identifies a specific interface on the network. An IP address is, generally represented as 4 octets of numbers from 0-255. The IP address has two parts- the network part and the host part. The first part of the IP address represents the network and the rest will specify the host including the individual device.

(ii)

Radio Waves	Microwaves
Frequency range of Radio Waves is 3 KHz and 1 GHz	Frequency range of Microwaves is 1 GHz to 300 Ghz
These are Omni- directional	These are Uni- directional
Used for Broadcast and one-to-one communication	Used for one-to-one communication between sender and receiver.

Q13. **Ishana Electronics Company headquaters has four blocks of buildings as shown:** (4)

Center to center distance between various blocks

B3 TO B1-50 M	B1 TO B2-60 M	B2 TO B4-25 M
B4 TO B3-170 M	B3 TO B2-125 M	B1 TO B4-90 M

Number of computers in each block :

B1-150   B2-15

B3-15   B4-25

The computers in each block are already networked, however the company now wants to connect the blocks.

i. Suggest the most appropriate topology for the connections between the blocks.

    a. Ring topology   b. Star topology

    c. Mesh topology   d. Bus topology

ii. The company wants internet accessibility in all the blocks. The suitable and cost-effective technology for that would be:

    a. Satellite   b. Lease line

    c. Telephone line   d. Broadband

iii. The company is planning to link its head office situated in New Delhi with the offices in hilly areas. Suggest a way to connect it economically:

    a. Micro waves   b. Coaxial cable

    c. Fibre optic   d. Radio waves

iv. Suggest the most appropriate location of the server and why?

    a. BLOCK B2   b. BLOCK B1

    c. BLOCK B4   d. BLOCK B3

Ans. (i) b. Star topology   (ii) d. Broadband

(iii) d. Radio waves   (iv) b. BLOCK B1 since it has the maximum number of computers.

PRACTICE PAPER–2(SOLVED)
COMPUTER SCIENCE (083)

Time allowed: 2 hours   Maximum Marks: 35

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

(SECTION A)
Each question carries 2 marks

Q1. **Differentiate between queues and stacks**   (2)

Ans.

Stacks	Queues
A Stack is a data structure that follows the LIFO (Last In First Out) principle.	A Queue follows the FIFO(First in First Out) principle.
We can add and remove an element from the top/last place only	It is open from both the ends hence we can easily add elements to the back and can remove/delete elements from the front.
We use append ( ) to add an element at the top/last place and pop( ) to remove the element from the top/last	We use append ( ) to add an element at the top/last place and pop(0) to remove the element from the first place.

Q2. **(i) Expand the following:**   (1)
   `HTTP , FTP`
   (ii) You want to share some audio files from your friend's laptop using Bluetooth what kind of network is this?   (1)

Ans. (i) Hyper Text Transfer Protocol, File Transfer Protocol
   (ii) PAN-Personal Area Network

Q3. **(i) Which constraint specifies the values in the column must be unique?**
   (ii) Which constraint specified with a column uniquely identifies each row in a table?   (2)

Ans. (i) UNIQUE   (ii)   PRIMARY KEY

Q4. **Differentiate between fetchone( ) and fetchall( )**   (2)

Ans. **fetchall( ) :** Whenever we execute the SELECT query using the cursor.execute() method the cursor.fetchall() method extracts a result set of all the rows. It returns these rows as a list of tuples. An empty list is returned if there is no record to fetch.

   fetchone( ): Whenever we execute the SELECT query using the cursor.execute() method it creates a cursor object. The cursor.fetchone() method returns a single record as a tuple and it returns None if no rows are available.

Q5.   Write the output of the queries (a) to (d) based on the table SMARTWATCH, given below: (2)

Table: SMARTWATCH

WATCHID	NAME	PRICE	QTY_STORE
W1	Fitbit Versa	21000	100
W2	Apple Watch	55000	150
W3	Garmin Fenix	75000	50
W4	Fitbit Versa	21000	100
W5	Samsung Galaxy	27000	200
W6	Amazfit Watch	17000	100
W7	Fossil Hybrid	15000	50

a) SELECT * FROM SMARTWATCH WHERE PRICE>=21000 AND QTY_STORE>100

b) SELECT SUM(QTY_STORE) FROM SMARTWATCH WHERE NAME IN ("Fitbit Versa", "Fossil Hybrid");

c) SELECT MAX(PRICE)+ MIN(PRICE)   FROM SMARTWATCH;

d) SELECT AVG(PRICE) FROM SMARTWATCH

Ans.   a)

W2	Apple Watch	55000	150
W5	Samsung Galaxy	27000	200

b) 250

c)   90000   d) 33000

Q6.   **(i)**   Which command is used to see the table structure   (1)

(ii)   What is a Cartesian join or product on two tables?   (1)

Ans.   (i)   DESC tablename or DESCRIBE tablename

(ii)   The Cartesian join is used to generate a paired combination of each row of the first table with each row of the second table. This join type is also known as cross join. The resultant rows are a product of the number of rows in each table.

Q7.   **In the table Loan below**   (2)

(a)   Identify the candidate key(s) from the table **Loan**.

(b)   Which field will be considered as the foreign key if the tables **Customers** and **Loan** are related in a database?

Table Loan

LoanID	LoanDate	ID	EMI	Years
1101	2021-03-01	5	20000	4
1102	2021-02-06	3	10000	2
1103	2021-04-12	4	10000	3
1104	2021-05-15	5	5000	3

Table Customers:

ID	Name	Age	City	Salary
1	Kashika	37	Jammu	80000.00
2	Anupriya	35	Shimla	75000.00
3	Vijayan	36	Hyderabad	65000.00
4	Krishnan	35	Chennai	55000.00
5	Harsh	37	Gandhinagar	85000.00
6	Raisa	32	Mumbai	45000.00

Ans. a)   LoanID and LoanDate   b)   ID is the foreign key

(SECTION B)

Each question carries 3 marks

Q8. **Coach Abhishek stores the races and participants in a dictionary. Write a program, with separate user defined functions to perform the following operations:**   (3)

- Push the names of the participants of the dictionary onto a stack, where the distance is more than 100.

- Pop and display the content of the stack. For example:

  If the sample content of the dictionary is as follows:

  Races ={100:'Varnika', 200 :'Jugal', 400:'Kushal', 800:'Minisha'}}

  The output from the program should be:

  Minisha Kushal Jugal

Ans.
```python
Races ={100:'Varnika',200:'Jugal', 400:'Kushal',800:'Minisha'}
def PUSH(Stk,N):
    Stk.append(N)
def POP(Stk):
    if Stk!=[]:
        return Stk.pop()
    else:
        return None
stack1=[]
for i in Races:
    if i>=200:
        PUSH(stack1,Races[i])
```

```
while True:
    if stack1!=[]:
        print(POP(stack1),end=" ")
    else:
        break
```

Q9. **(i) A table, Students has been created in a database with the following fields:**   (3)

StudentID, NAME, DOB, CITY, MARKS

Give the SQL command to change the datatype of CITY from Varchar(30) to Char(30).

(ii) Which of the following is a DML command?

SELECT…FROM, CREATE TABLE, INSERT, UPDATE

Ans. (i) ALTER TABLE Students MODIFY COLUMN CITY char(30);

(ii) DML: SELECT…FROM, INSERT INTO, UPDATE…SET

Q10. **Maniklal Fabrics is creating a database called Stores with a table called City_Store. Write the SQL commands for doing the same.**   (3)

Store_id	INT Primary Key
Manager	Varchar(20)
Address	Varchar(30)
City	Varchar(20)
City_Code	Char(5)
Last_update	Date

Ans. The SQL commands are:

```
CREATE DATABASE STORES;
CREATE  TABLE  City_Store  (Store_id  INT  PRIMARY  KEY,  Manager  VARCHAR(20),
Address VARCHAR(30), City VARCHAR(20),  City_Code CHAR(5), Last_update date );
```

(SECTION C)

Each question carries 4 marks

Q11. **A database called ecompany has two tables COMPANY and CUSTOMER with the following records. Write SQL commands for the queries (a)-(d) based on the two tables COMPANY and CUSTOMER**   (4)

COMPANY

PID	NAME	CITY	PRODUCTNAME
2101	APPLE	DELHI	WATCH

2102	SAMSUNG	BANGALORE	MOBILE
2103	PANASONIC	DELHI	TV
2104	SONY	MUMBAI	MOBILE
2105	LENOVO	INDORE	TABLET
2106	DELL	MUMBAI	LAPTOP

COUSTMER

CUSTID	NAME	UNITPRICE	QTY	PID
101	REENA SONI	60,000	10	2102
102	MICHAEL PAUL	50,000	20	2106
103	MEETALI SINGH	70,000	15	2101
104	PARUL SOHAL	55,000	3	2103
105	RAJESH DESWAL	45,000	7	2104

a) Write an SQL statement to display the name of the companies in reverse alphabetical order.

b) To add one more column to the table customer called TOTAL_PRICE which can have up to two decimal places.

c) Write an SQL statement to count the products city wise.

d) Write an SQL statement to display the customer name, product of the unit price and quantity, product name where the name of the city is Mumbai.

Ans. a) `SELECT NAME FROM COMPANY ORDER BY NAME DESC;`

b) `ALTER TABLE CUSTOMER ADD TOTAL_PRICE DECIMAL(10,2);`

c) `SELECT COUNT(*), CITY FROM COMPANY GROUP BY CITY;`

d) `SELECT CUSTOMER.NAME, UNITPRICE*QTY, PRODUCTNAME FROM COMPANY, CUSTOMER WHERE COMPANY.PID=CUSTOMER.PID AND CITY= 'MUMBAI';`

Q12. (i) Give two advantages and two disadvantages of ring topology. (4)

OR

Define the following terms:

`Web Browser, Web server`

(ii) Differentiate between wired and wireless Transmission Media.

Ans. (i)

Ring Topology	
Advantages	**Disadvantages**
This arrangement prevents collisions.	Needs more cable than bus.

Data packets travel at greater speeds.	Any snag in the cable ring crashes the network.
Any problems with device and cable can be easily located.	The network activity is disturbed when adding or removing a node.

OR

Web Browser: This is an application software used to view or browse web pages from a web server. Have to type the exact URL to view the web page to request for a web page. This has no database. Google Chrome, Safari, Mozilla Firefox, Microsoft Edge are some popular web browsers.

Web Server: This is a technologically advanced machine that stores all the files containing the web pages which can be viewed by the web browser. Web Servers store, process and deliver web pages to the users when they receive a request from a browser. The Web Server provides the storage space for website files. Apache Server is the most popular server.

(ii) Wired Transmission Media: Wired transmission media are the cables that are used in networking. Popular wired transmission media are twisted pair cable, co-axial cable and fiber optical cable. Each of them has its own characteristics like transmission speed, effect of noise, physical appearance, cost etc.

Wireless Transmission Media: Wireless transmission media are the ways of transmitting data without using any cables. Nowadays wireless communication is becoming popular as it is not bounded by physical geography. This transmission uses Microwave, Radio wave, Infrared or a combination of these.

Q13. **Jeevan CareGivers Company has set up its head office with 4 blocks of buildings named Block A, Block B, Block C and Block D.** (4)

The number of computers in each block are:

Block A-25   Block B-50

Block C-125   Block D-10

Shortest distances between various Blocks in meters:

Block A to Block B-60 m   Block B to Block C-40 m

Block C to Block A-30 m   Block D to Block C-50 m

(i) Suggest the most suitable place (i.e. block) to house the server of this company with a suitable reason.

(ii) Suggest the type of network to connect all the blocks with suitable reason.

(iii) The company is planning to link all the blocks through a secure and high speed wired medium. Suggest a way to connect all the blocks.

(iv) Suggest the most suitable wired medium for efficiently connecting each computer installed in every block out of the following network cables:
   - Coaxial Cable
   - Ethernet Cable
   - Single Pair Telephone Cable.

Ans. (i) Block C , It has maximum number of computer.

(ii) Since the distance between the blocks is less than 1 Km and LAN can be upto 10 Km

(iii) Star topology   (iv) Ethernet Cable

PRACTICE PAPER–3(SOLVED)
COMPUTER SCIENCE (083)

Time allowed: 2 hours 　　　　　　　　　　　　　　　　　　　　Maximum Marks: 35

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

(SECTION A)
Each question carries 2 marks

Q1. Differentiate between enqueue and dequeue. 　　　　　　　　　　　　(2)

Ans.

Enqueue	Dequeue
This adds an element to the end of the queue and we can use append( ) to add element at the end or rear of the queue.	This removes or deletes the element from the beginning of the queue. We use pop(0) to remove element from the first place.

Q2. **(i) Expand the following:** 　　　　　　　　　　　　　　　　　　(1)

　　　 `HTML, URL`

(ii) Which is the transmission medium for TV remotes? 　　　　　　　(1)

　　　 `Infrared, Coaxial cable, Optical fibre, Microwave, Ethernet cable.`

Ans. (i) Hyper Text Markup Language, Uniform Resource Locator

(ii) Infrared

Q3. **(i) Which SQL logical operator is used to compare a value with a NULL value?** 　(2)

(ii) Which SQL logical operator is used to search for the presence of a row in a specified table that meets a certain criterion?

Ans. (i) IS NULL 　　　　　(ii) EXISTS

Q4. How can one create a cursor object? Which property can be used to output the number of rows resulting from the SQL Query? 　　　　　　　　　　　　　(2)

Ans. You can create cursor object using the cursor() method of the Connection object/class. The rowcount property is used to output the number of rows resulted from the SQL query.

Q5. Write the output of the queries (a) to (d) based on the table store_items, given below: 　(2)

Item_Id	Item_Name	Item_Brand	GST	Price	Unit
1001	Milk	Verka	Cat1	25	litre
1002	Curd	Verka	Cat1	50	kg
1003	Lassi	Verka	Cat1	30	litre
1004	Chaach	Amul	Cat1	20	litre
1005	Unpacked Paneer	None	Cat1	100	kg
1006	Eggs	None	Cat2	48	dozen
1007	Gur	None	Cat3	40	kg
1008	Honey	None	Cat3	200	litre
1009	Salt	Tata	Cat4	21	kg
1010	Sugar	None	Cat7	60	kg
1011	Tea	Tata	Cat8	370	kg
1012	Edible Oils	Various Brands	Cat13	100	litre
1013	Roasted Coffee Beans	Bru	Cat8	100	kg

a) SELECT Sum(Price) FROM store_items WHERE GST in ("Cat1", "Cat2");

b) SELECT count(Distinct Item_Brand) FROM store_items;

c) SELECT Item_Name FROM store_items where Unit Like "d%";

d) SELECT * FROM store_items WHERE Price>=200 AND Item_Brand!="None";

Ans.　a) 273　　　　　　　　　　　　　　　　b) 6

c) Eggs　　　　　　　　　　　　　　　　　d)

1011	Tea	Tata	Cat8	370	kg

Q6. **(i) Which clause limits the returned data to a row count?**　　　　　　(2)

(ii) What is an equi join?

Ans.　(i) LIMIT <number of rows>

(ii) Equi Join

SQL EQUI JOIN performs a JOIN against equality or matching column(s) values of the associated tables. In this join columns from two tables are compared for equality using an equal sign (=) as comparison operator in the WHERE clause to refer equality. The equi join results in duplicate columns.

Syntax

```
SELECT column_list FROM table1, table2 WHERE table1.column_name
=table2.column_name;
```

Q7. **Consider the table, Store_Items given below:**　　　　　　　　(2)

Table Store_Items:

Item_Id	Item_Name	Item_Brand	CategoryID	Price	Unit
1010	Milk	Verka	Cat1	20	litre
1012	Curd	Amul	Cat1	50	kg
1003	Lassi	Vita	Cat1	30	litre
1024	Chaach	Amul	Cat1	20	litre
1006	Eggs	None	Cat2	48	dozen
1007	Gur	None	Cat3	40	kg
1008	Honey	None	Cat3	200	litre
1009	Salt	None	Cat4	21	kg

(a) Identify the candidate keys of the table.

(b) Which field should be made the primary key? Justify your answer.

Ans. (a) Item_Id and Item_Name are the candidate keys

(b) Item_Id should be made the primary key as it uniquely identifies each record of the table.

(SECTION B)

Each question carries 3 marks

Q8. Create a function enqueue( ) to add multiples of 3 up to 30 to a queue. Then dequeue all the items of this queue using dequeue( ), this function returns the deleted item each time or otherwise it displays an appropriate error message. Display the numbers from the queue in a single line.　　　(3)

Ans.
```python
#Adding elements to the queue
def enqueue(data):
    queue.append(data)

#Removing elements from the queue
def dequeue():
    if len(queue)>0:
        return queue.pop(0)
    return ("Queue Empty!")

# executable code
queue=[]
for x in range(3,30,3):
    enqueue(x)
for i in range(len(queue)):
        print(dequeue(),end=" ")
```

Q9. **(i)** Write the SQL statement to change the Price of Milk from 25 to 30 in the table STORE_ITEMS given below. (3)

Item_Id	Item_Name	Item_Brand	Item_Category	Price	Unit
1001	Milk	Verka	Cat1	25	litre
1002	Curd	Amul	Cat1	50	kg
1003	Lassi	Vita	Cat1	30	litre
1004	Chaach	Amul	Cat1	20	litre

(ii) Write the category DDL, DML or DCL for the following commands

  `GRANT, DROP TABLE, INSERT INTO, UPDATE…SET, REVOKE`

Ans. (i) `UPDATE STORE_ITEMS SET Price=25 WHERE Item_Id='1001';`

 (ii) `DDL: DROP TABLE`

  `DML: INSERT INTO, UPDATE. ..SET`

  `DCL: GRANT, REVOKE`

Q10. Ravish is a Database Admin who joins a Technology company DataSys. The company has a database to which Ravish wants to add another table. What will be the SQL commands for creating the table while checking whether the table COUNTRIES already exists. (3)

The following are the details of the table structure:

COUNTRY_ID	CHAR(5) PRIMARY KEY
COUNTRY_NAME	VARCHAR(20)
ADDRESS	VARCHAR(30)
CITY	VARCHAR(20)
CITY_CODE	CHAR(5)
CURRENCY	DECIMAL(10,0)

Ans. The SQL commands are:

CREATE TABLE IF NOT EXISTS COUNTRIES (

COUNTRY_ID CHAR(5) PRIMARY KEY,

COUNTRY_NAME VARCHAR(20),

ADDRESS VARCHAR(20),

CITY VARCHAR(20),

CITY CODE CHAR(5),

CURRENCY DECIMAL(10,0));

(SECTION C)

Each question carries 4 marks

Q11. **Write the SQL statement to display all the information asked in queries (a-d) based on the tables below:** (4)

SALESPERSON TABLE

salesperson_id	name	city	incentive
1001	Nitin Jairam	Delhi	0.12
1002	Gaurav Jha	Kolkata	0.13
1007	Vinita S	Hyderabad	0.11
1003	Jockim Lobo	Bangalore	0.15
1005	Arun Mehta	Bhopal	0.14
1006	Vinny Noom	Mumbai	0.12

ORDER TABLE

order_No	purch_amt	order_date	customer_id	sales person_id
30001	1500	2019-10-15	2002	1003
30002	2400	2019-09-05	2005	1002
30003	2100	2019-11-25	2001	1007
30004	3200	2019-10-07	2006	1003
30005	3520	2019-08-12	2003	1005
30006	2600	2019-03-01	2004	1007
30007	2100	2019-11-25	2007	1001
30008	3200	2019-10-07	2006	1003
30009	3520	2019-08-12	2003	1005
30010	2600	2019-03-01	2001	1007

a) Delete the record from order table where order number is 30009

b) Write an SQL statement to display customer_id and salesperson_id from order table where purch_amount is between 1000 and 2500.

c) Write a query to display all the columns from salesperson sort the result in an ascending order by the name and incentive.

     d)   Write an SQL statement to display salesperson_id and sum of purch_amount from order table grouped by customer_id.

Ans.   a)   `DELETE FROM order WHERE order_no=30009;`

        b)   `SELECT customer_id, salesperson_id FROM order WHERE purch_amount BETWEEN 1000 AND 2500;`

        c)   `SELECT * FROM salesperson ORDER BY name, incentive;`

        d)   `SELECT salesperson_id, SUM(purch_amt) FROM order GROUP BY customer_id;`

Q12.   **What is network Topology, explain with examples of topologies.**   (4)

Ans.   Network Topology is the geographical, physical or logical arrangement of computer networking devices. Topology is the way in which the various nodes or computers of a network are linked together or the actual layout of the computer network hardware.

      Some Network Topologies are: Bus Topology, Ring Topology, Star Topology, Mesh Topology and Tree Topology.

Q13.   **National Skill Training Academy has for wings A, B, C, D**   (4)

      Distance between various wings are given below:

Wing A to Wing B-100m	Wing A to Wing C-200m
Wing A to Wing D-400m	Wing B to Wing C-300m
Wing B to Wing D-100m	Wing C to Wing D-450m

      Number of Computers installed at various wings are as follows:

Wing A-20	Wing B-150
Wing C-50	Wing D-25

      (i)   Suggest the best wired medium and the cable layout to efficiently connect various wings of National Skill Training Academy.

      (ii)   Name the most suitable wing where the Server should be installed.Justify your answer.

      (iii)   Suggest a device/software and its placement that would provide data security for the Academy.

      (iv)   What will be needed to provide wireless Internet access to all smartphone/laptop users in the Academy.

Ans.   (i)   Optic Fibre and Star Topology.

      (ii)   Wing B as it has the maximum number of computers

      (iii)   Firewall with the server in Wing B.

      (iv)   A High bandwidth Broadband Connection and Wi-Fi Router.

MOCK TEST–I
COMPUTER SCIENCE (083)

Time allowed: 2 hours   Maximum Marks: 35

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

(SECTION A)

Each question carries 2 marks

Q1. Differentiate between push and pop in stacks.   (2)

Q2. (i) Expand the following: (1)

`FTP, TCP/IP`

(ii) What is the approximate bandwidth of a typical voice signal?   (1)

Q3. Which SQL logical operator allows the existence of multiple conditions in an SQL statement's WHERE clause?

Which SQL logical operator is used to compare a value to any applicable value in the list as per the condition?   (2)

Q4. Which method of the Cursor Class is used to execute an SQL statement? What does the cursor( ) do?
                                                                                                           (2)

Q5. Write the output of the queries (a) to (d) based on the table SCHOOLADMIN, given below: (2)

ADMNO	NAME	STREAM	DOB	PHONE	SECTION
101	Srishti B	Business Admin	2005-05-12	1234322934	NULL
102	Aman Pratap	Sciences	2005-11-02	671343224	B
103	Shivam	Sciences	2006-01-23	511343224	A
104	Banita	Business Admin	2005-10-12	132412934	NULL
105	Myra	Fine Arts	2005-07-01	124455931	C
106	Raghav	Humanities	2005-06-05	42155931	D
107	Medini	Fine Arts	2005-09-05	512155931	C

| 108 | Udai Veer | Sciences | 2006-11-25 | 551343224 | B |
| 109 | Gaurav | Legal Studies | 2005-03-15 | 321155931 | NULL |

a) SELECT Max(DOB) FROM SCHOOLADMIN;

b) SELECT Name FROM SCHOOLADMIN WHERE STREAM!="Business Admin" AND SECTION IS NULL;

c) SELECT count(NAME) FROM SCHOOLADMIN WHERE SECTION IS NOT NULL;

d) SELECT count(NAME) FROM SCHOOLADMIN WHERE SECTION IS NOT NULL AND STREAM="FINE ARTS";

Q6. (i) Which clause aggregates the base data?   (2)

Which clause filters the aggregated data?

(ii) What is a natural join?   (2)

Q7. Consider the tables **GSTCategory** and **Store_Items** given below:

(a) Table: **GSTCategory**

CategoryID	Category_Name	GST
Cat1	Fresh Dairy	0
Cat10	DryFruit Cat1	5
Cat11	DryFruit Cat2	5
Cat12	Spice Cat 2	5
Cat13	Packaged Fat	12
Cat14	Packaged Oil	12
Cat15	DryFruit Cat2	12

Table Store_Items:

Item_Id	Item_Name	Item_Brand	CategoryID	Price	Unit
1010	Milk	Verka	Cat1	20	litre
1012	Curd	Amul	Cat1	50	kg
1003	Lassi	Vita	Cat1	30	litre
1024	Chaach	Amul	Cat1	20	litre
1006	Eggs	None	Cat2	48	dozen
1007	Gur	None	Cat3	40	kg
1008	Honey	None	Cat3	200	litre
1009	Salt	None	Cat4	21	kg

(a) Identify the degree and cardinality of the GSTCategory table.

(b) Which field will be considered the foreign key if the tables GSTCategory and Store_Items: are related in a database?

(SECTION B)

Each question carries 3 marks

Q8. Competent Couriers take user input for the name, address and phone number of the receiver and store these in a tuple which is then pushed to a stack called parcelstock. Write a program, with separate user defined functions to perform the following operations: (3)

- Push the details(name, address, phone) into a stack using the function Push(parcelstock,details).

- Pop and display the content of the stack

Q9. (i) Write the SQL statement to add a field Country_Code(of type Integer) to the table Countries with the following fields. **Country_id, Country_name, Continent, Region_id**

(ii) Which of the following is not a DML command?

```
DELETE FROM, DROP TABLE, CREATE TABLE, INSERT INTO
```

Q10. Sahil wants to create a database HARDWARE which has a table RENTAL. He wants to make sure that city name is unique and no field is left empty in the table. Write the SQL commands for the fields given below.

RENTAL_ID	INT	PRIMARY KEY
RENTAL_DATE	DATETIME	NOT NULL
INVENTORY_ID	VARCHAR(6)	NOT NULL
CUSTOMER_ID	VARCHAR(6)	NOT NULL
RETURN_DATE	DATETIME	NOT NULL
CITY	VARCHAR(6)	UNIQUE NOT NULL

(SECTION C)

Each question carries 4 marks

Q11. The table FLIGHT_BAGGAGE shows data about the number of baggage , total weight in kg for baggage and cost per extra kg for different classes. The PASSENGER table shows the passengers with extra baggage weight. Using the information given below write the SQL query for a)-d) (4)

TABLE FLIGHT_BAGGAGE

PAXCODE	PAX_CLASS	BA	TKGA	CPEKG
101	FIRST	3	90	300
102	BUSINESS	3	80	300

103	ECOPLUS	2	50	400
104	ECONOMY	2	40	500
105	SPECIAL	4	100	400

TABLE PASSENGER
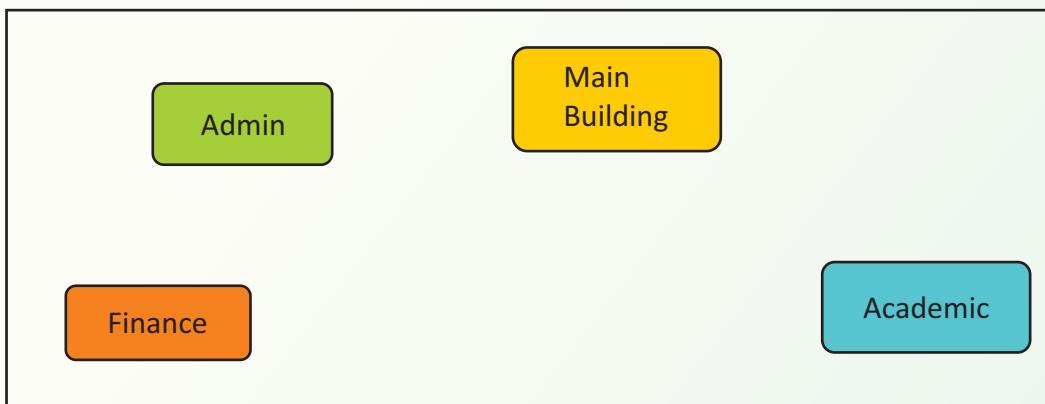
NO	NAME	TRAVELDATE	EKG	PAXCODE	NOB
11	Ridhima Sen	2019-12-13	10	101	3
13	Gary Sandhu	2019-12-21	15	103	3
15	Ganesh V	2019-12-23	8	102	2
12	Salim Malik	2019-11-13	15	102	3
17	Geralene N	2019-12-10	11	104	2
14	Venkatesh	2019-11-28	8	105	4
16	Saed Bajwa	2019-11-06	20	101	3

BA-Bags Allowed
TKGA- Total Kilograms Allowed

EKG- Extra KG
CPEKG- Cost per extra KG
NOB- Number of Bags

a) Write an SQL statement to display NO,NAME,TRAVELDATE from the table PASSENGER in descending order of NO.

b) Write an SQL statement to display all the classes from table FLIGHT_BAGGAGE where weight allowed is more than 75 Kg

c) Write an SQL statement to display the PAXCODE and their number from PASSENGER table, grouped by the PAXCODE more than 1 in number.

d) Write an SQL statement to display the PAXCODE, NAME, PAX_CLASS from both tables where Extra KG is more than 10

Q12. (i) What are five Components of Data Communication?   (4)

(ii) Differentiate between a Hub and a Switch.

Q13. National Centre for Indigineous Arts has just set up a new campus and they want to set up a Local area network.   (4)

The distances between various buildings of university are given as:-

Main to Admin   50mtr

Main to Finance   100 mtr

Main to Academic   70 mtr

Admin to Finance   50 mtr

Finance to Academic   70 mtr

Admin to Academic   60 mtr

Number of computers in each building:-

Main Building 150

Admin Building 75

Finance Building 50

Academic Building 60

As a network expert, you are required to give best possible solutions for the given queries of the university administration:-

(a) Suggest cable layout for the connections between the various buildings,

(b) Suggest the most suitable building to house the server of the network of the university,

(c) Suggest the placement of following devices with justification:

   1. Switch/Hub

   2. Repeater

(d) Suggest the technology out of the following for setting-up very fast Internet connectivity among buildings of the university

   1. Optical Fibre

   2. Coaxial cable

   3. Ethernet Cable

MOCK TEST–II
COMPUTER SCIENCE (083)

Time allowed: 2 hours   Maximum Marks: 35

General instructions:

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

(SECTION A)

Each question carries 2 marks

Q1. Differentiate between underflow and overflow in queues and stacks (2)

Q2. (i) Expand the following: (1)

      `ARPANET, NSFNET`

   (ii) What will be units to measure the size of high quality digital photograph? (1)

Q3. Which SQL logical operator is used to compare a value to similar values using wildcard operators? (2)

Which SQL logical operator reverses the meaning of the logical operator with which it is used?

Q4. What is the datatype of the result set extracted from the database using the cursor object when we use the following: (2)

a) fetchone( ) method   b)   fetchall( ) method

Q5. Write the output of the queries (a) to (d) based on the table country, given below: (2)

Code	Name	Continent	Surface area	Population	Life expectancy
AFG	Afghanistan	Asia	652090	22720000	46
AGO	Angola	Africa	1246700	12878000	39
AIA	Anguilla	North America	96	8000	76
ALB	Albania	Europe	28748	3401200	72
AND	Andorra	Europe	468	78000	84
ARE	United Arab Emirates	Asia	83600	2441000	74
ARG	Argentina	South America	2780400	37032000	75

ARM	Armenia	Asia	29800	3520000	66
ASM	American Samoa	Oceania	199	68000	75
ATA	Antarctica	Antarctica	13120000	0	Null

a) SELECT min(Population) FROM country;

b) SELECT max(SurfaceArea) FROM country;

c) SELECT avg(LifeExpectancy) FROM country Where Name Like "Ang%";

d) SELECT Code FROM country Where country.Name=country.Continent;

Q6. (i) Which clause sorts the final data?

(ii) Write the Syntax for Equi- join and Natural Join

Q7. Consider the table Travel given below:

TABLE: TRAVEL

CNO	CNAME	TRAVELDATE	KM	TAXI_CODE	NOP
101	Randeep Singh	2018-11-07	200	T01	12
102	Sharad Bali	2018-12-21	120	T04	4
105	Sangeeta M	2019-04-25	450	T01	15
103	Manish Nagpal	2019-01-29	280	T02	5
107	Veronica Masih	2019-03-12	365	T04	2
104	Dinesh Hoon	2019-10-28	200	T05	4
106	Ramita Malik	2019-03-12	100	T01	20

(a) Identify the degree and cardinality of the table.

(b) Which field should be made the primary key? Justify your answer.

SECTION – B
Each question carries 3 marks

Q8. Jiya has a list containing 8 integers. You need to help her create a program with two user defined functions to perform the following operations based on this list.

● Traverse the content of the list and push those numbers into a stack which are divisible by both 5 and 3.

● Pop and display the content of the stack.

For example the following list:

[5,15,21,30,45,50,60,75]

And should display:

75 60 45 30 15

Q9. (i) Write a SQL statement to rename the table Student to Student_new(considering this table does not already exist in the database)

(ii) Differentiate between DDL and DML Commands.

Q10. The database MavenAdmin already has a table DEPARTMENTS, write the SQL statements to add a table named HR_jobs with the following structure.

Field	Data Type	Remarks
JOB_ID	VARCHAR(10)	Primary Key
JOB_TITLE	VARCHAR(35)	Not Null
DEPARTMENT_ID	VARCHAR(10)	Foreign Key for DEPARTMENT_ID in DEPARTMENTS Table
EXPERIENCE	INT	
MIN_SALARY	DECIMAL(6,0)	
MAX_SALARY	DECIMAL(6,0)	

Section C
Each question carries 4 marks

Q11. Golden Rainbow school has a Schooladmin Database with the following Tables. Using the information given in the 2 tables write the SQL query for a)-d)

Table: Students

StudentID	Name	DOB	City	Sport	Email
1211	Anvi	2005-10-06	Chandigarh	Tennis	anvi@csmail.com
1212	Ananya	2005-09-11	Panchkula	TT	ana@csmail.com
1213	Bisman	2005-07-01	Mohali	Cricket	bisn@csmail.com
1214	Bani	2004-12-11	Chandigarh	TT	bani@csmail.com
1215	Brie	2005-03-16	Chandigarh	Squash	brie@csmail.com
1216	Diya	2006-07-11	Panchkula	Tennis	diya@csmail.com
1217	Fiza	2005-07-21	Mohali	Cricket	fiza@csmail.com
1218	Gauri	2004-12-30	Chandigarh	TT	Gari@csmail.com

Table: records

StudentID	Unit1	Unit2	Term1	Term2
1211	23	24	37	39
1212	21	21	32	33
1213	25	24	38	39
1214	22	23	30	31
1215	21	24	37	39
1216	24	21	32	33
1217	23	24	38	39
1218	21	23	30	31
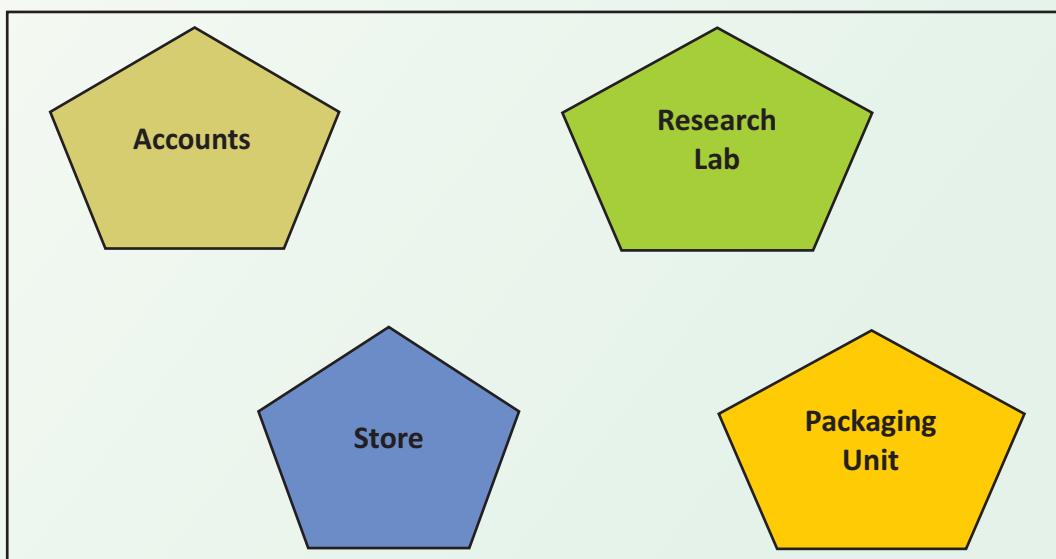
a) Write an SQL statement to display the StudentID, Name and Email of the students from Chandigarh who play TT.

b) Write an SQL statement to display the Name and marks of Unit1 and Unit2 for those students who scored above 44 marks after adding Unit1 and Unit2.

c) Write an SQL statement to display the Name and the total marks for the students from Mohali.

d) Write an SQL statement to display the average of the total marks of the students.

Q12. (i) Define the following terms: (4)

`Web Browser, Web server`

(ii) How is a Gateway different from a Repeater?

Q13. HerbalCity Pharma is a pharmaceutical company that has set up a new unit in Himachal Pradesh. They have the following blocks on the campus. (4)

The distance between various blocks is as follows:

Accounts to Research Lab	55 m
Accounts to Store	150 m
Store to Packaging Unit	160 m
Packaging Unit to Research Lab	60 m
Accounts to Packaging Unit	125 m
Store to Research Lab	180 m

Number of Computers

Accounts	35
Research Lab	110
Store	25
Packaging Unit	70

As a network expert, provide the best possible solutions for the following:

i)   Suggest a cable layout of connections between the blocks.

ii) Suggest the most suitable block to house the server of this organization.

iii) Suggest the placement of the following device with justification:

   a) Repeater   b) Hub/Switch

iv) Suggest a system (hardware/software) to prevent unauthorized access to or from the network.