Chapter-6: Database Management System

Ques. ▶ 1

TID	T Name	Subject
101	Mr. Monir	English
102	Mr. Niloy	ICT
103	Mr. Nur	Biology

Teacher's Table

TID	Group	Time
101	Science	10:00
101	Humanities	10:45
102	Science	10:45
102	B. Studies	10:00
103	Science	11:30

Routine Table

[D.B; Dj.B; J.B; S.B-18]

a. What is cipher text? 1
b. Explain query command "Select Roll, Name From Students". 2
c. Explain data type of the fields of Teacher's Table. 3
d. Which type of relation will be possible between tables of the stem? Analyze. 4

Answer to the question no. 1

a Cipher text is the result of encryption performed on plain text using an algorithm.

b SELECT statement is used to retrieve any data from a table. Many other clauses are used with SELECT statement to retrieve data. To do data retrieve, SQL is built with Select, From, Where expressions.

Syntax for Select statement is —
SELECT Field1, Field2, Field3.....
FROM tablename
WHERE condition

In the query command ''Select Roll, Name From Students''- Roll and Name are two fields and Students is table name. So Select Roll, Name From Students indicates a query where it will display the data of Roll and Name from the Students table.

c Data types of Teacher's table are given below:

Field name	Data type	Description
TID	Number	In the number/numeric field, necessary numbers of integer and float can be used along with the signs of addition and substraction. Mathematical operation (addition, substraction, multiplication, division) is also possible on the data of this field.
TName and Subject	Text	In the text/character field, alphabet, number, sign etc. can be used. Normally 255 number of alphabet/number/sign can be used in total in this field. But any type of mathematical operation is not possible here.

d The following conditions have to be followed to create relation among two database.

1. There must be at least one common field among the relational data tables. Data type, field size and format etc. needs to be same of the common field.
2. There must be a primary key in a table among the relational tables.

From the above discussion it is clear that among the two tables, TID is the common field and their data type, field size and format etc. are same. Again, among the two tables, TID is the primary key for Teacher's table. So, it seems that all the required conditions are present here. So, it is possible to create relation among the tables of the stem. Moreover, TID, TName, Subject fields are present in Teacher's table and TID, Group, Time etc. fields are present in Routine table of the stem. Here, it seems that in the first table, a value of TID field (101) has a relation with numerous values of the TID field (101→101,101 and 102→102,102) of 2nd table. If a record of a table in a database has a relation with numerous values of another table, then the relation is called one to many relation. So, one-to-many relation is present among the two tables of the stem.

Ques. ▶ 2

Name	Roll	DOB	Tution Fee
R	1011	05/01/2002	3500/-
S	1012	07/02/2001	4200/-
P	1013	09/05/2003	3700/-
J	1014	10/12/2003	4000/-

Pic-1

Roll	Subject	Number	GPA
1011	ICT	70	A
1012	ICT	85	A+
1013	ICT	90	A+
1014	ICT	75	A

Pic-2

[R.B; C.B; Ctg.B; B.B-18]

a. What is query language? 1
b. "Privacy is the main element of data security". Explain. 2
c. Describe the process of adding address field between Roll and DOB in the table of fig-1 used in the stem. 3
d. Which type of relation will be possible between two tables of the stem? Explain your opinion. 4

Answer to the question no. 2

a To find out any information in accordance with any specific condition form numerous information stored in a database is called query. Language that is used todo query is called query language.

b Ensure data security from unknown person is known as data security. Data is to be secured for ensuring data safety. Method of hiding data is known as data encryption. Encryption is such a method that translates man's understandable language to non-understandable form. As a result, unknown person or organization fail to understand the non-recognized format of data, so possibility of using the encrypted data by them is zero. These encrypted data can only be read by the specific person. So it can be said that, privacy is the main element of data security.

c In the above stem, to change the structure of the table, first it is required to be opened. Then, Design view from View button of the Ribbon requires to click. As a result, table's structure will be viewed. In table-1, after Roll and before DOB; a new field 'Address' requires to add. So, we have to click the right button after taking mouse pointer on the row of DOB. After that if we click the Insert Row form Pop-up menu, a new row will be inserted. After that typing address in new row will include a new field named address.

d The following conditions have to be followed to create relation among two database.

1. There must be at least one common field among the relational data tables. Data type, field size and format etc. needs to be same of the common field.
2. There must be a primary key in a table among the relational tables.

If we take a look, we can see that there is a common field named 'Roll' and their data type, filed size and format etc. are same. Again, a primary key 'Roll' is exist in the 1st table. So it is very clear that all the required conditions are here among the two tables. So, it is possible to create relation among two tables.

Moreover, in the 1st table Name, Roll, DOB, Tution Fee fields are present and in the 2nd table, Roll, Subject, number, GPA etc. fields are present. Here it seems that, a value of Roll field from first table (1011) has a relation with a value of Roll field from 2nd table (1011→1011, 1012 →1012, 1013 →1013 and 1014 →1014). If a record of a table has a relation with a record of another table in a database is known as one to one relation. So, it is possible to create one to one relation among two tables of the stem.

Ques. ▶3 Principal of Collegiate Girls' School and Women's College takes initiative to create database for the students. He takes decision to create database using student's name, roll number, father's mobile number, date of admission fields. *[D.B-17]*

a. What is indexing? 1
b. Explain the role of database administrator. 2
c. Describe the technique to create database table named 'Student' taking information of the above mentioned fields in the stem. 3
d. Which advantages-disadvantages will the college authority receive after creating database taking these fields? Give your analytical opinion. 4

Answer to the question no. 3

a Index is the method to arrange the records under a database table in a logical order without changing the main database file.

b Database administrator do the work of creation, update, delete, control etc. for a database. Moreover he also does the work of creating database structure, establishing data dictionary for storing description of the data used in database system and also the value of data. It is his main duty to ensure data security. These all are the tasks done by database administrator.

c Necessary codes to create the table taking mentioned fields such as student's roll number, name, father's mobile number, admission date etc. are given below —

CREATE TABLE Student text (Roll_number NUMBER(10) primary key, Name (20), Father_Mobile_Number NUMBER(20), Admission_Date DATE);

Table that will create after writing the above code is given below.

Roll_Number	Name	Father_Mobile_Number	Admission_Date

Here, primary key is Roll_Number. Each and every information of primary key field required to be different that means there shouldn't be any duplicate information present there. Description of the data types for student table is given below.

1. Roll-Number field has to be have number type data and this field should not be empty any time, since it can insert Not Null value.
2. Data type for Name field is to be Character type its length is to be 20.
3. Data type for Father_Mobile_Number field is to be number type and its length will be 20.
4. Data type for Admission_Date field is Date type and its length will be 10.

d Advantages that can be bought after the creation of Student Table taking student's roll number, name, father's mobile number, admission date etc. are given below—

1. Data entry will be easy.
2. Relation between the data table with another data table will be possible.
3. Necessary data can be easily bought from numerous data.
4. Data entry can be controlled using data validation.
5. Data transmission from one database to another will be easier.
6. Accurate mathematical calculation will be possible for number type data.
7. It will be possible to create report in different formats and print them.
8. It will be possible to create level taking necessary information and print them.
9. It will also possible to create different types of charts.
10. Attractive data entry form will also be possible.
11. It will become possible to use data taking from other programs (such as- FoxPro, Excel etc.).

Ques. ▶4

ID	Name	Address
1001	Anika Azad	Kushtia
1002	Shafin Hasan	Dhaka
1003	Adnan Jaami	Rangpur

Table-1

SI	Designation	Salary
1	Manager	40,000
2	Officer	25,000
3	Accountant	50,000

Table-2

It is said to show those person's name and designation from the above tables whose salary is 40000 and more than that. A person named 'B' do that work using conditional command. But this process takes some time. The person named 'C' said, this work will be faster by creating an important file. He also says that this process will take some more time at the time of data entry. *[R.B.-17]*

a. What is RDBMS? 1
b. Why do SQL call the main element of database? 2
c. Add necessary column to create relation between the above tables. 3
d. Will you agree with the person 'C'? Analyze. 4

Answer to the question no. 4

a Full form of RDBMS is Relational Database Management System. RDBMS is the combination of necessary complex programs having relation among them.

b Full form of SQL is Structured Query Language. It is a strong data manipulation and definition language. SQL can process numerous data at a time.
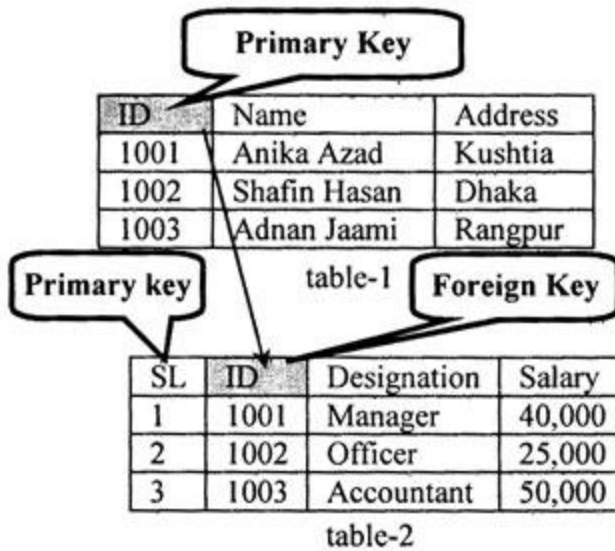
Tasks that have been done using SQL nowadays are- doing data query, ordering data, updating data, deleting data, controlling database object access, ensuring database consistency etc. That's why SQL is called the main appliance of database.

c There is no common field between table-1 and table-2 in the above stem. So, necessary steps to create relation among these tables is given below.

First of all, primary key for table-1 is to be the foreign key for table-2. That's how relation may possible.

It has been shown below with necessary diagram.

If a primary key of a database table is used as a normal key for another database table, then it can be called the foreign key for second database table.

Primary Key

ID	Name	Address
1001	Anika Azad	Kushtia
1002	Shafin Hasan	Dhaka
1003	Adnan Jaami	Rangpur

table-1

Primary key   Foreign Key

SL	ID	Designation	Salary
1	1001	Manager	40,000
2	1002	Officer	25,000
3	1003	Accountant	50,000

table-2

Here, ID field has been used as the primary key for table-1, whereas it has been used as foreign key for table-2. Since, ID field is common among these two tables, so it is possible to create relation.

d Things that the Person 'C' told is indexing. I am consensus with him.

Index is the presentation of information with a good accordance. Since index helps a person to find anything from a book, whereas database index table helps us to find anything very easily and quickly from a database.

In a database, index has been done depending on one or more fields and then it has been arranged alphabetically or numerically.

To find out data easily: It becomes very easy to find any data from a database where indexing has been done.

To do updating automatically: If a record is included in a database file after indexing has been done, it can automatically updater the index file.

To increase the efficiency of various operations of database: Index has been done to do the works such as searching, sorting, and reporting and queries etc. very simultaneously.

To keep the main file remain unchanged: Index file don't change the main file but arrange the main file in various orders. From the above discussion it can be said that index can increase the overall speed.

Ques. ▶5

Roll	Name	Date of Birth	Remarks
101	Rima	21-10-2000	
102	Sima	11-12-1999	
103	Apu	13-07-1998	
104	Jahid	22-12-1999	

[Dj.B.-17]

a. What is router?   1
b. Explain character by character data transmission method. 2
c. Explain the technique of creating above table.   3
d. What advantages or disadvantages will we receive after storing data according to the stem? Give your logical opinion.   4

Answer to the question no. 5

a A router is a networking device that forwards data packets between computer networks. Router perform the traffic direction functions on the internet.

b A data transmission system where data transmits character by character form sender to receiver is known as asynchronous transmission. In asynchronous system, a character of 7 bits is being created after pressing each alphabet of the key-board. This 7 bits data is converted to 8 bit or 1 byte data after adding a parity bit with it. One start and one or two stop bit is to add with this 8 bit before starting the data transmission. As a result, each character data is converted to 10 or 11 bit data.

c To create the table first it is required to create the empty table for the above stem and then it will require to entry data in the table. SQL statement to create the table is given below:

```
create table student (
    Roll Number (10) Primary Key,
    Name text (20),
    Date_of_Birth Date,
    Remarks text (125));
insert into student (Roll, Name, Date_of_Birth) Values (101, "Rima", "21-01-2000");
insert into student (Roll, Name, Date_of_Birth) Values (102, "Sima", "11-12-1999");
insert into student (Roll, Name, Date_of_Birth) Values (103, "Apu", "13-07-1998");
insert into student (Roll, Name, Date_of_Birth) Values (104, "Jahid", "22-12-1999");
```

d If data is stored, then it will store in the table. That means if data is stored in the table for any website, then the website will be considered as dynamic website.

Advantages to store data in data table —

1. User can change the contents in accordance to his wisdom.
2. Information will update very easily.
3. There is opportunity to display own data for specific users.
4. There is opportunity to take data from users.
5. There is opportunity to store numerous data.
6. Attractive and interactive lay-out can be made.
7. Database is used so there is opportunity to find any data doing query.

Disadvantages of having data table-

1. Database is used so it will take more time to load data in the browser.
2. Development and controlling are more complicated.
3. Much more expensive.
4. It is required to use php, Asp, Jsp languages.

Ques. ▶6 Student's name, roll, section, GPA etc. items are used to create database. Many programs help are also needs to take. Data updating, maintenance becomes beautiful. [Dj.B-17]

a. What is data encryption?   1
b. Explain big organizations database.   2
c. Explain unique data item according to the stem.   3
d. Give your opinion about the primary works of the above programs.   4

Answer to the question no. 6

a Data encryption is the process where plain text data is converted to cipher text data.

b Big organizations database are known as corporate database. Big organizations means big business organizations such as- bank, insurance, mobile company, government non-government economic organizations etc. In the internet based system, big organizations are using special software to keep harmony of the branch offices with their head office and this special software is known as corporate database.

c In the above stem student's roll, name, section, GPA etc. are present to create database table for the students. For this database table students' name, section, GPA etc. might be same for many students. But roll number will not same for them. Each student has individual roll number. Which is called the primary key in database.

The attribute which is used to fully identify any specific entity is called primary key. So, in this database, the primary key is roll number. This roll is the unique data in the database. This roll field can be used to create relation among two or more tables in the database.

Unique key can be used to do any mathematical, operational tasks. If any new information is included in the database that will automatically update the other tables also. Moreover any information of all students can be easily obtained through this way.

d The primary tasks of the above programs are to create database tables, modernization, to ensure security and maintenance. All these things are discussed below.
1. Database create and maintenance.
2. Insert new data/record.
3. To correct spelling of data and find out errors of numbers and correct them.
4. Delete unnecessary data/record.
5. To do data query.
6. To ensure database security.
7. Report creating and print them.
8. To arrange full database in accordance to any field.
9. To reduce data duplication.
10. To do data sorting and indexing.
11. To update database.

Moreover some tasks are there which have to do taking permission of database administrator and they are —
1. To create database structure.
2. To assemble the works of taking users information and storing them.
3. To change database with the necessity.
4. To create data dictionary for storing values of the data.
5. To ensure the creating of application programme according to user's choice.
6. To protect the users who do not have permission.
7. To maintain database security.

Ques. ▶7

Roll	Name	Address
01	Rana	Dhaka
02	Kamal	Bogra
03	Rana	Bogra

Result Sheet

Roll	Name	GPA
01	Rana	5.00
02	Kamal	4.75
03	Rana	5.00

[C.B-17]

a. What is data encryption? 1
b. Write differences between algorithm and flow-chart. 2
c. Which type of field will you use to search information from Student Information table of the stem and why? Explain. 3
d. Which type of relation is possible between the tables used in the stem? Analyze. 4

Answer to the question no. 7

a Data encryption is the process where plain text data is converted to cipher text data.

b Differences between algorithm and flow-chart are given below.

	Algorithm		Flow-chart
1.	Algorithm is the logical and sequential presentation of any problem's solution.	1.	Figure which is used to slow the flow of any system or program is called flow-chart.
2.	To insert into algorithm high level language is used.	2.	Programs in flow-chart are planned through some geometric and symbolic signs.
3.	Algorithm depends on description.	3.	Flow-chart is figure dependent.
4.	It is required to create pseudocode before writing the algorithm.	4.	It is not required to create pseudocode before drawing flow-chart.

c Primary key field is used to search information from the table of the stem.

Primary key of the student information table is student roll. This roll number can be used to find out all the information of that student from the table. Because, each and every value of primary key field is unique. So, each student has unique roll number which can be used to search any specific entity.

If student roll is the common field between numerous tables, then it is possible to create relation among them. So, it is possible to do any mathematical, operation task between these tables. If any new information is included in the database, that will automatically update the other tables also. Moreover any information of all students can be easily obtained through this way.

d In the stem, student roll, name and address are present in table-1. Again, in table-2, student roll, name, GPA etc. are stored. So, student roll is the common field between two tables. One-to-one relation is possible between among these tables using this common field.

In table-1, Roll is the primary key. Roll is also present in table-2. One-to-one relation is presented below between table-1 and table-2.

Roll	Name	ADDRESS
01	Rana	Dhaka
02	Kamal	Bogra
03	Rana	Bogra

Roll	Name	Gpa
01	Rana	5.00
02	Kamal	4.75
03	Rana	5.00

In the above two tables, relation is built through Roll field. Because it is one of the main condition of having a common field in case of creating relation. Since Roll field works as the common filed in that case it has become possible to create relation.

Ques. ▶8

Roll	Name	F.Name	DoB	Roll	Name	Group	GP
501	Rabi	Nihar	25-09-01	501	Rabi	Bs	5.00
502	Sanu	Kabir	06-11-02	502	Sanu	Sc	4.95
503	Mila	Rabbain	09-09-01	503	Mila	Sc	4.65
504	Rabi	Zahid	12-12-99	504	Rabi	Bs	5.00

[Ctg.B-17]

a. What is record? 1
b. Why does we need to do data encryption? Describe. 2
c. Which problem will occur if Roll field is not present in Table-2 of the stem? Analyze. 3
d. Analyze the conditions of creating relation between Table-1 and Table-2 of the stem. 4

Answer to the question no. 8

a Record is constructed through the combination of numerous fields having inter-connection among them.

b Data encryption is a process where data of plain text is converted to the data of cipher text. Data encryption is required to ensure data safety in the database. Because in a multiuser environment, hackers can distorted data at the time of data transmission. That's why data encryption has been done to ensure data safety. Any unknown person or organization can not gain the ability of using encrypted data unless he knows the technique of data decryption.

c In the first table of the above stem, student's roll, name, father's name, date of birth etc. are present. Again, in the second table, student's roll, name, group, GPA etc. are stored. So, among these two tables student's roll is a common field. Through this common field one-to-one relation is possible among these tables.
But, if this field is not present in the second table, relation build-up is not possible. So, among these tables any types of mathematical, decisive, experimental work will not be possible. If any new information is added in that table, it will not update the information of another table. Through this process it will become difficult to search any information of all students.

d In the first table of the above stem, student's roll, name, father's name, date of birth etc. are present. Again, in the second table, student's roll, name, group, GPA etc. are stored. So, among these two tables student's roll is a common field. Through this common field one-to-one relation is possible among these tables.
In the first table, Roll is the primary key. Roll is also present in table-2. One-to-one relation between table-1 and table-2 is given below.

Roll	Name	Group	Gpa		Roll	Name	F.Name	DEB
501	Rabi	Bs	5.00		501	Rabi	Nihar	25-09-01
502	Sanu	Sc	4.95		502	Sanu	Kabir	05-11-02
503	Mila	Sc	4.65		503	Mila	Rabbian	09-09-01
504	Rabi	Bs2	5.00		504	Rabi	Zahid	12-12-99

In the above two tables, relation is built through Roll field. Because it is one of the main condition of having a common field in case of creating relation. Since Roll field works as the common filed in that case it has become possible to create relation.

Ques. ▶ 9

Roll	Name	DOB		Roll	Fees	Remarks
1001	Sawpnil	21-03-1998		1001	1570.00	Paid
1002	Tuhin	10-02-1999		1002	1300.00	Paid
1003	Tonmoy	19-03-2000		1003	780.00	Due

Table-A   Table-B

a. What is SQL?   1
b. Data will automatically update in an index file- explain. 2
c. Describe data type of the fields of Table-A of the stem. 3
d. Which type of relation is possible between mentioned tables of the stem? Analyze.   4

Answer to the question no. 9

a Full form of SQL is Structured Query Language. It is an unique data manipulation and definition language.

b Index file can be updated automatically after inputting any new record, if indexing is done to the database files. Because indexing is done depending on one or more fields. Any data table may have one or more index. Again more than one index might be opened at the same time but only one index file will actively control the order of displaying records at that time. As a result, because of having active index data will update automatically.

c Data types of table-A of the stem are described below.

First field of table-A-First field is numeric data type. Data which describes any number is known as numeric data. That means numeric data is number type data. Different number type data are discussed below:
Integer: Integer numbers are those who do not have any fraction value.Integer number might be positive or negative. Example: 125,-450 etc.
Floating point or fraction data: Floating point indicates rational numbers where fraction is to present. Example: 3.5, 4.50 etc.
In the stem, floating point data are used for providing result.
Second field of table-A: Second field is string data under non-numeric data. String data normally constructed with many characters. Example:Pen, apple, orange etc. are string type data.
Third field of table-A: Third field is Date/Time data under non-numeric data. Date/Time data is used to take input for time or date. Example: Date of Birth, Joining date, Admission date etc.

d In the stem, student roll, name and date of birth are present in table-A. Again, in the second table, student roll, fees and remarks are stored.So, among these two tables student's roll is a common field. Through this common field one-to-one relation is possible among these tables.
In the first table, Roll is the primary key. Roll is also present in table-2. One-to-one relation between table-1 and table-2 is given below.

Roll	Name	DoB		Roll	Fees	Remarks
1001	Swapnil	21/03/1998		1001	1570.00	Paid
1002	Tuhin	0010/02/1999		1002	1300.00	Paid
1003	Tonmoy	0019/03/2000		1003	780.00	Due

In the above two tables, relation is built through Roll field. Because it is one of the main condition of having a common field in case of creating relation. Since Roll field works as the common filed in that case it has become possible to create relation.

Ques. ▶ 10

Roll No	Name	ICT Marks	Roll No	Father's Name	Address	DoB
1	Shaheed	70	1	M Islam	Dhaka	12/11/99
2	Kabir	65	2	Abul	Rajshahi	12/12/99
3	Tarek	71	3	Ahmad	Khulna	13/12/99

Table-1   Table-1

a. What is database?   1
b. Data will automatically update in an index file.-Explain. 2
c. Describe data type of 1st, 2nd and 4th fields of Table-2. 3
d. Whether is it possible to create relation between two tables? Explain.   4

Answer to the question no. 10

a A database is a collection of information that is organized so that it can be easily accessed, managed and updated.

b Index file can be updated automatically after giving inputting any new record, if indexing is done to the database files. Because indexing is done depending on one or more

fields. Any data table may have one or more index. Again more than one index might be opened at the same time but only one index file will actively control the order of displaying records at that time. As a result, because of having active index data will update automatically.

c Data types of 1st, 2nd and 4th fields of table-2 are discussed below.

1st field of table-2: First field is numeric data type. Data which describes any number is known as numeric data. That means numeric data is number type data. Different number type data are discussed below:

Integer: Integer numbers are those who do not have any fraction value. Integer number might be positive or negative. Example: 125, -450 etc.

Floating point or fraction data: Floating point indicates rational numbers where fraction is to present. Example: 3.5, 4.50 etc.

In the stem, floating point data are used for providing result.

Second field of table-A: Second field is string data under non-numeric data. String data normally constructed with many characters. Example: Pen, apple, orange etc. are string type data.

Forth field of table-A: Forth field is Date/Time data under non-numeric data. Date/Time data is used to take input for time or date. Example: Date of Birth, Joining date, Admission date etc.

d In the stem, student roll, name and ICT marks are present. Again, in the table-2, student roll, father's name, address and date of birth are stored. So, among these two tables student's roll is a common field. Through this common field one-to-one relation is possible among these tables.

In the first table, Roll is the primary key. Roll is also present in table-2. One-to-one relation between table-1 and table-2 is given below.

Roll	Name	ICT Marks		Roll	Father's Name	Address	DoB
1	Shaheed	70		1	M Islam	Dhaka	12/11/99
2	Kabir	65		2	Abul	Rajshahi	12/12/99
3	Tarek	71		3	Ahmad	Khulna	13/12/99

In the above two tables, relation is built through Roll field. Because it is one of the main condition of having a common field in case of creating relation. Since Roll field works as the common filed in that case it has become possible to create relation.

Ques. ▶11

Roll	Name	City		Roll	Total Marks	Grade
101	Rifat	Khulna		101	800	A+
102	Fahmid	Dhaka		102	660	A−
103	Fahima	Habigonj		103	775	A
104	Istiaq	Barisal		104	800	A+

Table-1   Table-2

[B.B-17]

a. What is SQL?   1
b. Data will automatically update in an index file. Explain. 2
c. Explain data types according to the stem. 3
d. Verify possibility and advantages of creating relation among the two above mentioned tables. 4

Answer to the question no. 11

a Full form of SQL is Structured Query Language. It is an unique data manipulation and definition language.

b Index file can be updated automatically after giving inputting any new record, if indexing is done to the database

files. Because indexing is done depending on one or more fields. Any data table may have one or more index. Again more than one index might be opened at the same time but only one index file will actively control the order of displaying records at that time. As a result, because of having active index data will update automatically.

c Data types of the stem are discussed below.

Numeric data- Numeric data is data from which we can understand any number. That means numeric data indicates number related data. Example- Roll No, Total Marks of Student Table are numeric data.

Character data- Character type data indicates any letter, symbol or sign formatting code, control code or other specialized code. Example: Name, City, Grade etc. of Student Table are the character type data.

d It is necessary to create relation among two tables of the stem. Because to know grade point of students from student table-2 it is required to create relation of it with the Roll No of student table-1. There is a common field between student table-1 and student table-2, so one-to-one relation is possible. Advantages that will receive after creating relation between student table-1 and student table-2 are given below.

1. Data entry will be easy.
2. Relation between the data table with another data table will be possible.
3. Necessary data can be easily bought from numerous data.
4. Data entry can be controlled using data validation.
5. Data transmission from one database to another will be easier.
6. Accurate mathematical calculation will be possible for number type data.
7. It will be possible to create report in different formats and print them.
8. It will be possible to create level taking necessary information and print them.
9. It will also possible to create different types of charts.
10. Attractive data entry form will also be possible.
11. It will become possible to use data taking from other database programs (such as- FoxPro, Excel etc.).

Ques. ▶12

Table No.-1

Roll No.	Name	Address

Table No.-2

Roll No.	Group	Result

[D.B-16]

a. What is database? 1
b. Why do we use 'memo' data type? 2
c. Explain data type of the 3rd field of Table-2. 3
d. Verify the possibility of creating relation among two tables of the stem. 4

Answer to the question no. 12

a A database is a collection of information that is organized so that it can be easily accessed, managed and updated.

b Memo data type is used to write any descriptive information. In this field letter, total 65,536 sign, symbol, date etc. can be written. At the time of designing data table, a field is required to write descriptive information. That's why memo data type is to use. Normally memo data type is used to write nay remark.

c In the stem, 3rd field of table-2, data type is numeric. Data which describes any number is known as numeric data. That means numeric data is number type data. Different number type data are discussed below:

Integer: Integer numbers are those who do not have any fraction value. Integer number might be positive or negative. Example: 125, -450 etc.

Floating point or fraction data: Floating point indicates rational numbers where fraction is to present. Example: 3.5, 4.50 etc.

In the stem, floating point data are used for providing result. Moreover mathematical operations (addition, subtraction, multiplication, division) are possible on that data type.

d There is a possibility to create relation among the two tables of the stem. Main condition to create relation among database tables is- there is to be at least one common field. Data type, field size and format have to be same for common field and there must be a primary key field of one table. In that case, in the stem for table-1, roll no, name, address are present. Again, in table-2, rollno, group, result etc. are stored. So, among these two tables roll no is a common field. Through this roll no one-to-one relation is possible between two tables.

In the first table, Roll is the primary key. Roll is also present in table-2. One-to-one relation between table-1 and table-2 is given below.

ROLL	NAME	ADDRESS		ROLL	GROUP	RESULT
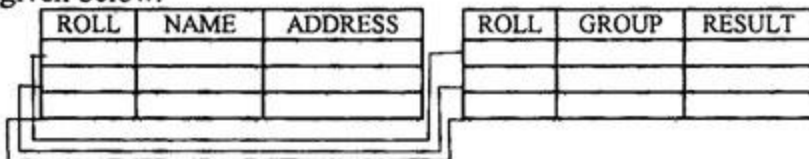
In the above two tables, relation is built through Roll field. Because it is one of the main condition of having a common field in case of creating relation. Since Roll field works as the common filed in that case it has become possible to create relation.

Ques. ▶13 General Hospital use two data table to store information of patients. In one data table patient's name, mobile number, date of birth are stored and in the other one mobile number, description of disease, prescription, fees are stored.   [Dj.B-16]

a. What is query language?   1
b. Data will automatically update in an index file. Explain. 2
c. Explain data type of the fields of 1st table of the database. 3
d. Whether is it possible to create relation between two tables? Analyze.   4

Answer to the question no. 13

a To find out any information in accordance with any specific condition form numerous information stored in a database is called query. Language that is used to do query is called query language.

b Index file can be updated automatically after giving inputting any new record, if indexing is done to the database files. Because indexing is done depending on one or more fields. Any data table may have one or more index. Again more than one index might be opened at the same time but only one index file will actively control the order of displaying records at that time. As a result, because of having active index data will update automatically.

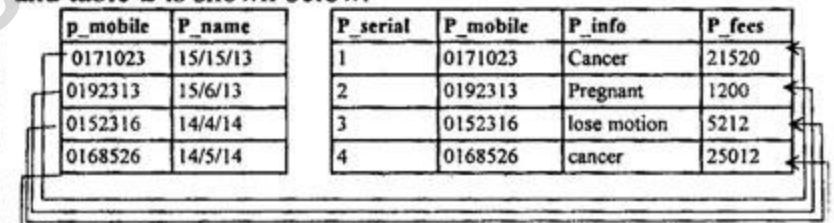| Roll	Name		Roll	Name
1	Dalia		1	Dalia
2	Papia	Indexing	2	Papia
4	Asif		3	Namira
			4	Asif
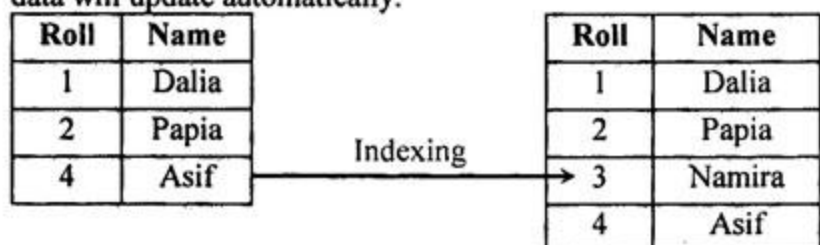
In the above figure, if a new roll no-3 is inserted in the table, data table will become update automatically in accordance to the roll no and it will take its place before roll no-4.

c Data type of the fields of 1st table are described below.

1. **Character data-** Character type data indicates any letter, symbol or sign formatting code, control code or other specialized code. Example: in the table of the stem patient's name is a character type data.

2. **Integer data:** Integer numbers are those who do not have any fraction value. Integer number might be positive or negative. Example: In the stem patient's mobile number is an integer type data.

3. **Date/Time data:** This data type is used for date and time type data. Example: Patient's date of birth of the stem is Date/Time type data.

4. **Numeric data-** Numeric data is data from which we can understand any number. That means numeric data indicates number related data. Example- In the stem, for fees data numeric data type is used.

5. **Memo-** Memo data type is used to write any descriptive information. In this field letter, total 65,536 sign, symbol, date etc. can be written. At the time of designing data table, a field is required to write descriptive information. That's why memo data type is to use. Normally memo data type is used to write nay remark. Example- In the stem, description of disease is a memo type data.

d In the 1st table of the stem, patient's name, mobile number and date of birth are present. Again, in the second table, mobile number, description of disease, prescription, fees etc. are stored. So, there is a common field between two fields. Through this mobile number, one-to-one relation is possible between these two tables.

Mobile number is the primary key for table-1. Mobile number is also present in table-2. One-to-one relation between table-1 and table-2 is shown below.

p_mobile	P_name		P_serial	P_mobile	P_info	P_fees
0171023	15/15/13		1	0171023	Cancer	21520
0192313	15/6/13		2	0192313	Pregnant	1200
0152316	14/4/14		3	0152316	lose motion	5212
0168526	14/5/14		4	0168526	cancer	25012

Relation is created between two bales of the stem using mobile number. Because mobile number is the common field between two tables.

Ques. ▶14 In an educational institution, student's name, father's name, address, date of birth, section etc. fields are included to create database.   [C.B-16]

a. What is database?   1
b. Write down the main condition to create relation between two tables.   2
c. Explain the above database creating process taking mentioned fields of the students.   3
d. Write the SQL command to add any two records of the stem and analyze them.   4

Answer to the question no. 14

a A database is a collection of information that is organized so that it can be easily accessed, managed and updated.

b In database, creation of relation among two or more tables for data transformation depending on any field is known as relation or relationship. Main conditions to create relation are: 1. At least one common field should be present; 2. Common filed should have to the primary key filed; 3. Common field's name, data type, field size etc. should have to be same; 4. Selected field's information of the primary key filed should have to be unique.

c Necessary codes to create table taking the mentioned fields such as student's ID, Name, Father's name, Address, Date of Birth, Section etc. of the stem are given below-

- CREATE TABLE Student (Id NUMBER(10) NOT NULL, Name TEXT/(20), Father_Name TEXT/(20), Address TEXT/(20), Date_of_Birth date10, Section TEXT (5));

Id	Name	Father_Name	Address	Date_Of_Birth	Section

Here, primary key is ID, which attribute or key is used to full identification of any specific entity. Every information of the primary key field requires to be unique that means there shouldn't be any duplicate information.

d SQL commands to join records of the student's two tables mentioned in the stem are given below-

- **Insert into** Student Values ("1001", "**Md.** Kamal", "Md. Jamal", "Dhaka", "10-12-2000", "A");

- **Insert into** Student Values ("1005", "**Md.** Hasnat", "Md. hosain", "Dhaka", "25-05-2001", "B");

After typing the above command data will be stored in the table as follows.

Id	Name	Father_Name	Address	Date_Of_Birth	Section
1001	Md. Kamal	Md. Jamal	Dhaka	10-12-2000	A
1005	Md. Hasnat	Md. hosain	Dhaka	25-05-2001	B

Ques. ▶15

Salesman Table

ID	Name
701	X
702	Y

Product Table

| P.ID	Company	Name	Unit Price
01	HP	Scanner	3000
02	HP	Printer	5000
03	Addata	RAM	2000
04	Cannon	Scanner	2000

[S.B.16]

a. What is query? 1
b. When does it require to have same primary key field between two data tables? Explain. 2
c. Which field of Product Table will you compare as primary field? Explain. 3
d. Which type of relation is possible between two tables of the stem comparing with the reality? Evaluate its influence in database management system. 4

Answer to the question no. 15

a To find out any information in accordance with any specific condition form numerous information stored in a database is called query.

b Primary key field needs to be same for two data tables at the time of creating relation.

At the time of database relation, key field is to be same because primary key of one field is used as normal key for another data table.
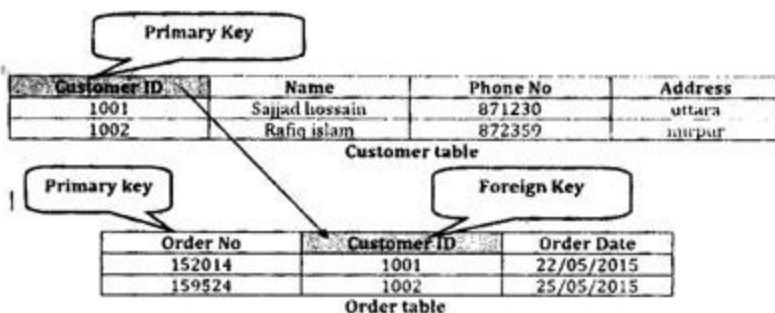
Here, in customer table, Customer ID is present as primary key but this field is present as foreign key for order table.
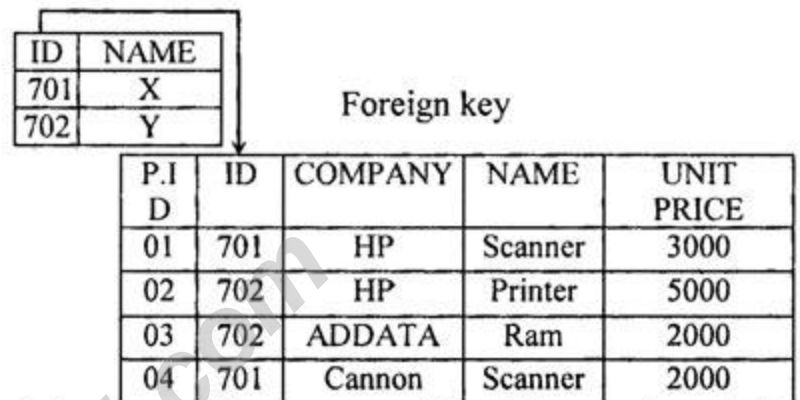
c P.ID field of product table is to be considered as primary field for product table of the stem, which is discussed below.

The attribute or key which is used to identify any specific entity is known as primary key. Each and every information of the primary key field needs to be unique, that means there should not be any duplicate information.

In the stem, P.ID field of product table is used to identify any specific entity. Because there is no duplicate information of P.ID field and it is possible to create relation with another table using P.ID field.

d In the two tables of the stem, many-to-many relation is possible.

ID of Salesman table is primary key. P.ID of product table is primary key. A salesman can sell more than one product whereas a product can be sold by more than one salesman. Which is shown below with example —

ID	NAME
701	X
702	Y

Foreign key

P.ID	ID	COMPANY	NAME	UNIT PRICE
01	701	HP	Scanner	3000
02	702	HP	Printer	5000
03	702	ADDATA	Ram	2000
04	701	Cannon	Scanner	2000

Relation is created between two tables of the stem through ID. Because ID is present as a common field between two tables.

Ques. ▶16

Relative authority is planning to update voter list of the election area 'A'. For this they said their information collector to collect necessary information such as voter name, father's name, age, religion, date of birth, birth place. A database file is has been created with these information. On the other hand, another file is created for population statistics using name, age and date of birth.

[J.B.-16]

a. What is SQL? 1
b. "Primary key and foreign key are not same." Explain. 2
c. Explain data type of the fields for database file of the stem. 3
d. How will you create relation between two files mentioned in the stem? Analyze. 4

Answer to the question no. 16

a Full form of SQL is Structured Query Language. It is an unique data manipulation and definition language.

b The attribute or key which is used to identify any specific entity is known as primary key. Each and every information of the primary key field needs to be unique, that means there should not be any duplicate information. If primary key of a table of the database is used as normal key for another data table, then primary key of first file is called the foreign key of 2nd file.
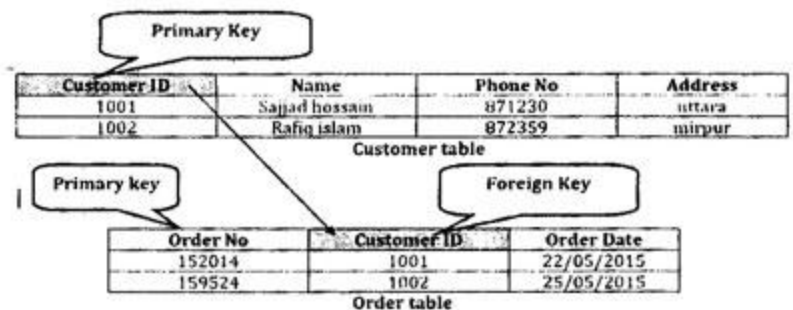
Here, in customer table, Customer ID is present as primary key but this field is present as foreign key for order table. That means primary key and foreign key are not same.

c Data types of the fields of the database are described below.

1. **Character data-** Character type data indicates any letter, symbol or sign formatting code, control code or other specialized code. Example: In the stem, voter's name, father's name, religion, birth place etc. are character data type.

2. **Integer data:** Integer numbers are those who do not have any fraction value. Integer number might be positive or negative. Example: In the stem age is an integer type data.

3. **Date/Time data:** This data type is used for date and time type data. Example: In the stem, voter's date of birth of the stem is Date/Time type data.

d In the 1st table of the stem, voter name, father's name, age, religion, date of birth are present. Again, in the 2nd table, voter name, age, date of birth etc. are stored. So, date of birth is a common field among two tables. One-to-one relation is possible among these two tables through this date of birth.

pdate is the primary key for table-1. pdate is also present in table-2. One-to-one relation between table-1 and table-2 is shown below.

Pname	Pfnam	Page	Preli	ppalce	pdate
Abul	Karim	50	Islam	Vola	15/12/1965
Kuddus	Rahim	60	Islam	Ulla	15/12/1955
Mofiz	Wasim	55	Hindu	Rajl	15/12/1960
moga	Saurov	35	islam	azim	15/12/1982

pname	Page	pdate
Abul	50	15/12/1982
Kuddus	60	15/12/1955
Mofiz	55	15/12/1960
Moga	35	15/12/1982

Relation is created among two tables of the stem through date of birth. Because date of birth is present as a common field between two tables.

Ques. ▶17

ROLL	NAME	DOB
101	RAKIB	01/12/90
102	SAFFAT	23/06/95
103	ZARIYAH	03/08/99

Table-A

ROLL	FEES	REMARKS
101	1250.00	PAID
102	1000.00	PAID
103	700.00	DUE

Table-B

[B.B.-16]

a. What is database? 1
b. "Sorting requires more memory comparing to indexing". Explain. 2
c. Explain data type of 1st field of table-A. 3
d. Is it possible to create relation between two tables of the stem? Analyze. 4

Answer to the question no. 17

a A database is a collection of information that is organized so that it can be easily accessed, managed and updated.

b Sorting requires more memory comparing to indexing. Because, when we do sorting to a data file, serial no of main file will become change as a result and sorted main file will be stored as a sorted form in the memory.

c Data type of the 1st field of table-A of the stem is discussed below.

Data type of the 1st field is integer type data under numeric data type. There is no fraction in that data type. Example: In the stem, roll is a integer type data.

d In the 1st table of the stem, roll, name, DOB are present. Again, in the 2nd table roll, fees, remarks etc. are stored. So, among these two tables roll is a common field. Through this roll, one-to-one relation is possible among two tables.

In table-A roll is the primary key. Roll is also present in table-B. One-to-one relation between table-A and table-B is shown below.

ROLL	NAME	DOB	ROLL	FEES	REMARKS
101	RAKIB	01/12/90	101	1250.00	PAID
102	SAFFAT	23/06/95	102	1000.00	PAID
103	ZARIYAH	03/08/99	103	700.00	DUE

Relation is created among two tables of the stem through date of birth. Because date of birth is present as a common field between two tables.

Ques. ▶18

Roll No.	Name	Dept.	City
11051	Fariha	Science	Barisal
10510	Fabiha	Commerce	Pirojpur
15525	Sumaiya	Humanities	Barguna
13122	Nisha	Science	Patharghata

Student table

Roll No.	Total mark	Grade
11051	800	A+
10510	650	A−
15525	750	A
13122	800	A+

[Ctg. B-16]

a. What is record? 1
b. Explain data security technique. 2
c. Explain data types according to the stem. 3
d. Give opinion in favour of your answer mentioning reasons and advantages of creating relation among tables of the stem. 4

Answer to the question no. 18

a Record is constructed through the combination of numerous fields having inter-connection among them.

b Data security refers to the process of protecting data from unauthorized access and data corruption throughout its lifecycle. Data security ensures data safety for computer, database and websites from the destructive works of unauthorized person, organization and so on. Data security requires-

Privacy: Data can be only accessed by authorized person/organization.

Integrity: Data can be only changed by authorized person/organization.

Availability: Data will be only available to the authorized person/organization.

c **Data types are discussed below according to the stem.**

1. **Numeric data-** Numeric data is data from which we can understand any number. That means numeric data indicates number related data. Example- Roll No, Total Marks of Student Table are numeric data.

2. **Character data-** Character type data indicates any letter, symbol or sign formatting code, control code or other specialized code. Example: Name, City, Grade etc. of Student Table are the character type data.

d It is necessary to create relation among two tables of the stem. Because to know grade point of students from result table it is required to create relation of it with the Roll No of student table. There is a common field between student table and result table, so one-to-one relation is possible. Advantages that will receive after creating relation between student table and result table are given below.

1. Data entry will be easy.
2. Relation between the data table with another data table will be possible.
3. Necessary data can be easily bought from numerous data.
4. Data entry can be controlled using data validation.
5. Data transmission from one database to another will be easier.
6. Accurate mathematical calculation will be possible for number type data.
7. It will be possible to create report in different formats and print them.
8. It will be possible to create level taking necessary information and print them.
9. It will also possible to create different types of charts.
10. Attractive data entry form will also be possible.
11. It will become possible to use data taking from other database programs (such as- FoxPro, Excel etc.).

Ques. ▶19 Three students have been given instruction to search information from the result database of a college. 1st student search information using conditional command, 2nd student search information arranging information of database table and 3rd student takes less time comparing to 2nd student using fastest technique. *[R.B.-16]*

a. What is data encryption? 1
b. Explain the mode of informative database for NID. 2
c. Explain the method of searching information of the student-2. 3
d. Which one is the better method among the methods of student-1 and student-3? Give opinion with explaination. 4

Answer to the question no. 19

a Data encryption is the process where plain text data is converted to cipher text data.

b Database type for National ID card is relational database. In this database, data of one table basically has relation with data of another table. Database model is used to create relational database. Moreover it also describes entity set, attribute and value for database and further it decides data types and size of the attributes.

c In the case of searching information, technique which is used by the 2nd student is database indexing. Indexing is the system of arranging records in a specific way without changing serial number of inputted records of data file of the database. Index is the system of displaying content in a good accordance. Data is ordered in a good accordance to find any data easily from the database. Again, if data is arranged in any logical order, then it will also called index. If any new record comes to be inputted in the database, index file will automatically update the other files. As a result, serial no and file will remain unchanged.

d Among the techniques of 1st and 3rd student, 3rd student's technique is better. Analytical discussion on that sentence is given below.

3rd student's information searching technique is indexing. Index is the system of displaying content in a good accordance. If data is arranged in any logical order, then it will also called index. Data of the users are ordered in a good accordance to find any user's data easily from the database. That's why the 3rd student can easily find a student's information from college database taking less time comparing to others. On the other hand, 1st student technique is searching information by giving command with condition. It is time consuming to search any information from database giving any condition using query language. That's why conditional information searching requires more time comparing to index.

So, from the above discussion it is clear that, 3rd student's information searching technique is more suitable.

Ques. ▶20 Following table has been designed by an office for their employees:

Emp_id	Emp_name	Designation	Salary	Joining_data
1101	Md. Rahat Khan	Programmar	43000	01-Jan-08
1102	Md. Amzad Ali	Officer	35500	05-Feb-12
1103	Mrs. Sadia Islam	Accountant	22000	01-Jun-15
1104	Mrs. jebun Nahar	Operator	18500	10-Jan-16

[RAJUK Uttara Model College, Dhaka]

a. What is loop? 1
b. What is meant by indexing? Explain. 2
c. Write down SQL command to display Emp-id, Emp-name, Salary and Joining–date of the employees who has joined after 01/01/2012. 3
d. How will you make relation between the above table and the table that have been created by you? Analyze. 4

Answer to the question no. 20

a In computer programming, a loop is a sequence of instruction s that is continually repeated until a certain condition is reached.

b We know that data is stored in the form of records. Every record has a key field, which helps it to recognized uniquely.

Indexing is a data structure technique to efficiently retrieve records from the database files based on some attributes on which the indexing has been done. Indexing in database systems is similar to what we see in books. Indexing can be of the following types–Primary Index, Secondary Index, Clustering Index.

c Let, the name of the table is employee. So the SQL command to display Emp_id, Emp_name, Salary, Joining_date of the employee who has joined after 01/01/2012 is given below:

Select Emp_id, Emp_name, Salary, Joining_date

From employee

Where

Joining_date> 01/01/2012

d There are no table name in the stem. Let, the name of the table is Employee and the table which is created by me is Transfer. The fields of transfer is: ID, Transfer date, from college, New college.

The process to make relation between two of this table is following:

i.   First a table should be select then click 'Relationships' from Database Tools ribon.

ii.   'Show Table' will be shown.

iii. Click Add button after selecting Employee table from show table dialogue box. Then click Add button after selecting the Transfer table. Both table will be add on Relationships window.

iv.   Window will be show after clicking close button.

v.   ID field of Employee table should be drag and drop on the ID field of Transfer table. Next step of Relationships window will be shown.

vi.   Click on Enforce Referential Integrity. At last click on create button. Then the relationship will be make.

vii. Now, close the window after save it.

Ques. ▶21 Notice the following the table and answer the questions.

NAME	DESIGNATION	SALARY
Penny	Asst. Prof.	25,000
Bernadette	Lecturer	16,000
Robin	Asst. Prof.	26,000
Amy	Lecturer	16,500

Table : Teaching Staff

[Notre Dame College, Dhaka]

a.   What is DBMS? 1

b.   Which one needs more memory? Sorting of Indexing? Explain. 2

c.   Explain the Data Types of the fields given in the Table. 3

d.   Write the SQL. code to find out the records with salaries more than 20,000. 4

Answer to the question no. 21

a A database management system or DBMS is a collection of programs that enables you to store, modify and extract information from a database.

b Sorting means rearranging the Physical order of data in a database according to field. And Indexing means reordering the logical order of data. So sorting needs small amount of memory or no memory to re-order the data But indenting needs anyone memory to store the logical order of data without changing the main file. So Indexing needs more memory.

c In the stem there is a table is given. From the table we can see that there are there fields in the table such as NAME, DESIGNATION and SALARY. The data type of the NAME Field would be text type. This type, of datatype is used to store all character, number and special characters. But no mathmatical operation can be alone on the on. The data type of DESIGNATION field is also text type. And the field named SALARY has the data type of number type. It is used to store only the numerical value and mathematical operation can be done on the data is this field. It can store the real number valued data.

d There is a full named Teaching staff shown in the given stem. The table has there fields. One of the SALARY is a field which stores the salary of the person. It stores the numerical values as data. And the data type of this field is number.

SQL is a story uneque data on manipulation and definition language. It is a special–purpose programming language designed for managing data field in relation database management system. We can use SQL query to hind the records with salaries more than 20000. The query would be us follows:

```
select *
from teaching staff
where SALARY > 20000;
```

Ques. ▶22 A College namely ABC has created a database for storing their students information by the combination of Roll, Name, Date of birth, Fees, Contact-no. field. An office assistant arranged the records applying such a technique where new addition of records demands rearrangement of the database. By the order of the principal another office assistant applied a technique for arranging the new record automatically.

[Viqarunnisa Noon School & College, Dhaka]

a.   What is cryptography? 1

b.   Write down the conditions for making relation more than one data table. 2

c.   Explain the method of making a table on the basis of field mentioned in the stem. 3

d.   Whose technique is convenient between the two office assistants of ABC college, Give your logical opinion. 4

Answer to the question no. 22

a Cryptography is a method of protecting information and communications through the use of codes so that only those for whom the information is intended can read and process it.

b The conditions for making relation more than one data table is given below:

i.   There should be at least one common field between relational data tables. The data type, field size and format etc of common field could be same.

ii.   At least primary key of a table must be needed between relational tables.

c The method of making a table on the basis of field mentioned in the stem is following:

```
create table students
(
Roll          Number (10),
Name          Char (20),
Date_of_Birth Date,
Fees          Number (10,2),
Contact_No    Char (20)
);
```

d The first technique is Sorting. Sorting in database is like arranging rows in order based on a particular column (s). It may be in alphabetic order, or numeric order, or order by date also. It also refers to operation of organizing data in specific

order i.e Ascending or descending. On the other hand, another technique is Indexing. Indexing is a way to optimize performance of a database by minimizing the number of disk accesses required when a query is processed. An index or database index is a data structure which is used to quickly locate and access the data in a database table. Indexes are created using some database columns. SO, by this discussion we can say that the 2nd technique is much convenient.

Ques. ▶23 Student Information: Result Sheet:

Roll	Name	Address
01	Raka	Dhaka
02	Rafi	Dhaka
03	Rina	Dhaka

Roll	GPA	Phone #
01	5.0	7614252
02	5.8	9714252
03	5.0	9714323

[Ideal School and College, Motijheel, Dhaka]

a. What is cipher text? 1
b. What is the condition for creating relation? 2
c. Explain the data type of table 1 and table 2. 3
d. Which type of relation can be create between two table? Explain with your opinion. 4

Answer to the question no. 23

a In cryptography, cipher text is the result of encryption performed on plaintext using an algorithm, called a cipher.

b The conditions for making relation more than one data table is given below:

i. There should be at least one common field between relational data tables. The data type field size and format etc of common field could be same.

ii. At least primary key of a table must be needed between relational tables.

c The data type of table 1 and table 2 is following:

Field name	Data type	Description
Roll, GPA, Phone	Number	In Number/Numeric field there are some symbol like addition/subtraction are held and also we can use integer value/fraction value in this field.
Name, Address	Text	Here, letter/number/symbol etc could be use. Normally highest 255 letter/number/symbol could be use singly or collectively.

d Similar as answer no. 2(d).

Ques. ▶24 Observe the following stem:

Roll	Name	DOB
101	Rakib	01/01/1990
102	Nadim	10/08/1991
103	Latif	01/03/1997

Semester	Fees	Remarks
1st	12,000	Paid
2nd	10,000	Paid
3rd	8,000	Due

Table-1   Table-2

[Dhaka City College, Dhaka]

a. What is data security? 1
b. "The value of a primary key never been duplicate" explain. 2

c. Describe the data-type of the usable field for table-1 and table-2. 3
d. How to create a relationship between table-1 and table-2 by using RDBMS? Analyze. 4

Answer to the question no. 24

a Data security refers to the process of protecting data from unauthorized access and data corruption.

b Primary Key is a field in a table which is used to identify records uniquely. It can't hold duplicate values and null values. If a primary key contains similar values then we can't indentify a entity. That's why the primary key is been set in the way that it can't have duplicate values.

c In the stem there are two tables are shown. The table-1 has three fields which are Roll, Name and DOB. Among them the Roll field has the data type of number or numeric type. Number and numeric is the data type is used to store numeric values and we can use arithmetic operation in it. The Roll field has the data type of text type. The text type data is used to store character, special character and number but we can't do any arithmetic operation in it. The DOB field has the data type of date or time. From the table-2 we can say the fields are used in it are Semester, Fees and Remarks. Here semester and remarks have the text data type. And Fees has the data type of number or numeric.

d There are two tables are shown in the stem. From them table-1 has three fields and table-2 has also three fields. Roll, Name and DOB are the fields of table-1 and semester, fees and Remarks are the fields of Table-2. From here we can say that there are no common fields between the two tables. From the relational model we know that if we want to create any relation a common field is necessary between tables. And the common field will be the primary key of one table and foreign key of another table as well as the data type and size of the field will be same of the two fields. Here Roll is primary key of table-1. So if we want to create relation then we have to add roll as the foreign key of Table-2. The new form of Table-2 will be:

Roll	Semester	Fees	Remarks
101	1st	12000	Paid
102	2nd	1000	Paid
101	3rd	8000	Paid

Ques. ▶25

SIF		
Roll	Name	Section
35001	Karim	Al
36336	Rahim	A2
38081	Zahid	A3
38520	Salman	A4

Result		
Roll	Marks	GPA
35001	890	5
35001	870	4.8
38081	900	5
38520	880	4.9

[Dhaka Commerce College, Dhaka]

a. What is database management system? 1
b. "Database index file becomes update automatically" — Explain. 2
c. Explain data types of the fields used in the two database table in the stem. 3
d. Explain realtion type by making relation between the two tables 'SIF' and 'Result' in the stem. 4

Answer to the question no. 25

a A database management system (DBMS) is system software for creating and managing databases. The DBMS provides users and programmers with a systematic way to create, retrieve, update and manage data.

b See the answer no. 9(b).

c There are two tables in the stem and they are 'SIF', 'Result'. The data type of the fields used in two database table are following:

In SIF table:

Field name	Data type
1. Roll	Numeric/Number type
2. Name, Section	Text/Character type

In Result table:

Field name	Data type
1. Roll, Marks, GPA	Numeric/Number type

So, tables are created with Numeric/Number type and Text/Character type data fields.

d Similar as answer no. 7(d).

Ques. ▶26

IDNo	Name	Group	DOB
1001	Ishita	Sce	10/10/2004
1002	Lubaba	Com	11/10/2004
1003	Jerin	Hum	11/02/2004

Table-1

ID No.	Marks	Grade
1001	800	A^+
1002	750	A
1003	650	A^-

Table-2

[Adamjee Cantonment College, Dhaka]

a. What is cyfertext? 1
b. Compare between Indexing and Sorting. 2
c. What problem code arise if the ID No. field was not there in Table -2 of the stem-analyze. 3
d. Analyze and give your opinion about the possibilitees to establish a relationship between the tables in the stem? 4

Answer to the question no. 26

a See the answer no. 23(a).

b Difference between sorting and indexing are as shown:

Sorting	Indexing
Sorting is the process of arranging the items into a particular order.	Indexing is the process which is used for improving the data retrieval speed of a table.
The sorted table will require same amount of storage space as the unsorted table.	The space requirement of the indexed file is less than the space requirement of sorted filies.
Searching and running queries are less fast in sorted table than indexed table.	Searching and running query are faster in indexed table.
Sorting will change the order of rows.	Indexing would not change the order of the records of the table.

c There will be no common field find out if the ID NO. field was not there in Table–2 of the stem. The problems which will arise are given below:

i. Files will be in different formats.
ii. Storage device need more space.
iii. There will be no central control.
iv. Data can not be shared.
v. Data security will be less.
vi. Data backup and recovery will be no longer.

d The conditions for making relation more than one data table is given below:

i. There should be at least one common filed between relational data tables. The data type field size and format etc of common field could be same.

ii. At least primary key of a table must be needed between relational tables.

The fields Table–1 are– Id No., Name, Group, DOB. And the fields of Table–2 are – ID No., Marks, Grades So, ID No. is the common field between two tables. The data type of common fields are also same. So, there are a possibility to establish a relationship between the tables. By taking ID No. field as primary key we can establish a relationship between the tables.

Ques. ▶27

Name	Roll	DOB	Tuition fee
R	1011	05/01/2002	3500/-
S	1012	07/02/2001	4200/-
P	1013	09/05/2003	3700/-
J	1014	10/12/2003	4000/-

Roll	Subject	Number	GPA
1011	ICT	70	A
1012	ICT	85	A+
1013	ICT	90	A+
1014	ICT	75	A

[BAF Shaheen College Dhaka]

a. What is query language? 1
b. Privacy is the main weapon of security-Explain? 2
c. Describe the procedure to insert a field named Address between Roll and DOB fields of the above stem. 3
d. What type of relation may be built between two tables? Explain your view. 4

Answer to the question no. 27

a See the answer no. 2(a).

b See the answer no. 2(b).

c See the answer no. 2(c).

d See the answer no. 2(d).

Ques. ▶28
A table named 'Admission' is created with student's Roll, Name, Group, DoB, Acc–No. and Email field to make a database for Shaheed Bir Uttam Lt. Anwar Girl's College. *[Shaheed Bir Uttam Lt. Anwar Girls College, Dhaka]*

a. Define RDBMS. 1
b. Why indexing needs more memory than sorting? 2
c. Determine and explain the key fields used in Admission table. 3
d. Create the table and input a record using SQL. 4

Answer to the question no. 28

a A relational database management system (RDBMS) is a database management system (DBMS) based on the relational model of data. Most databases in widespread use today are based on his model.

b Without changing the order of the records of the table indexing arrange the file in logical order but sorting arrange the file with the base of any specific field. New files are created at the time of indexing but not in sorting. So indexing needs more memory than sorting.

c Similar as answer no. 9(c).

d The fields are Roll, Name, Group, DOB, ACC–No. and Email. With this fields the commands for create a table named Admission are in the below:

Create table Admission(

Roll Number primary key,

Name Text (20);

Group Text (10);

DOB Date,

ACC_No Text (15),

Email Text (25)

);

For that, a table will be created as the name of Admission. The command for input a record using SQL in this table is following:

insert into Admission (Roll, Name, Group, DOB, ACC–No, Email) values (201, "Real", "Science", "23–12–1991", A–101", "real. oronno3@gmail.com");

Ques. ▶29 $3^3 + 7^3 + 11^3 + \ldots\ldots + n^3$.

[Dhaka Residential Model College, Dhaka]

a. What is Pseudocode? 1
b. "Some rules are follow naming variables" — explain. 2
c. Write down the flowchart of the above mentioned series. 3
d. "It is possible to solve the above mentioned series by for and do-while loop." – explain. 4

Answer to the question no. 29

a Pseudocode is a notation resembling a simplified programming language, used in program design.

b The rules to be followed in naming variables are–

1. The first letter of the variable must be alphabetic letter, (a.... z, A.... Z)

2. More than one variable of the same name can not be introduced in a function.

3. There can be no space in the name of a variable.

4. A digit or number can not begin the variable name.

c A flowchart is drawn below for the sequence of stem —
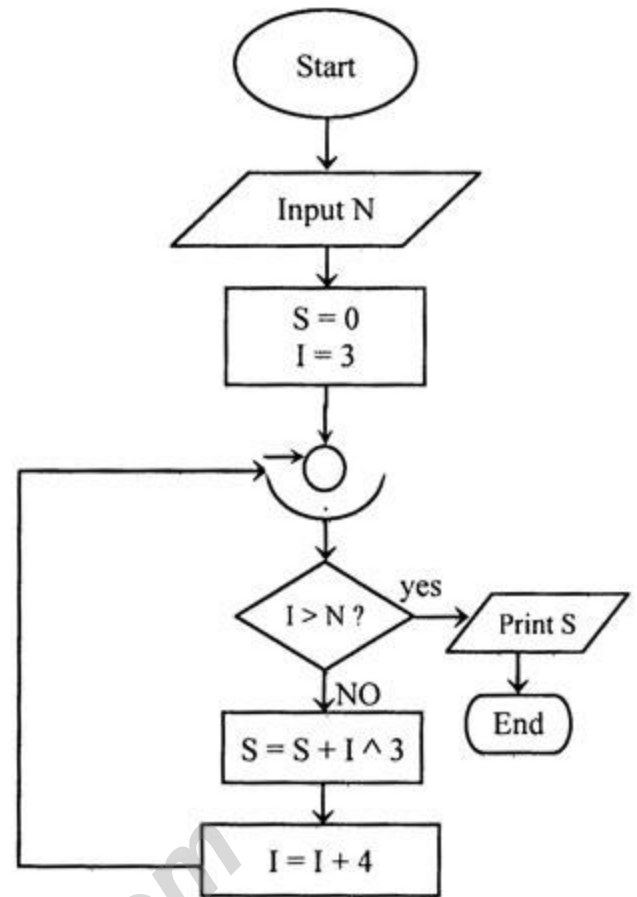
d The sequence of the stem is solved using for and do-while loop —

For loop	do-while loop
# include<stdio.h>	# include < stdio.h>
# include<math.h>	# include <math.h>
main ()	main ()
{	{
int n, a, s = 0;	int n, a = 3, s = 0;
scanf ("%d", &n);	scanf ("%d",&n);
for (a = 3; a< = n; a = a + 4)	do
{	{
s = s + pow (a,3);	s=s + pow (a, 3);
}	a = a + 4;
printf ("sum is: % d",s);	}
}	while (a < = n);
	printf ("sum is:%d", s);
	}

Ques. ▶30

Roll	Name	Address		Roll	Name	GPA	Grader
1001	Tamim	Dhaka		1001	Tamim	5.00	Mole
1002	Noman	Sylhet		1002	Noman	5.00	Mole
1003	Sakib	Shariotpur		1003	Sakib	4.75	Mole
	Table-1				Table-2		

[Dhaka Residential Model College, Dhaka]

a. What is data encryption? 1
b. "Primary and foreign key are not same" – Explain. 2
c. Describe the date type of the above mentioned two table. 3
d. What type of relationship exist of the above mentioned two table? – explain. 4

Answer to the question no. 30

a Data encryption translates data into another form or code. So that only people with access to a secret key (formally called a decryption key) or password can read it. Encrypted data is commonly referred to as ciphertext, while unencrypted data is called plaintext.

b Primary key and foreign key are not same. It is explained with appropriate reasons below—

1. Foreign table works with two tables but primary key works with key.
2. Data of foreign key can be duplicate where for the case of primary key, data can not be duplicated.
3. More than one foreign key of different tables can exist in one table but there can be only one primary key in one table.

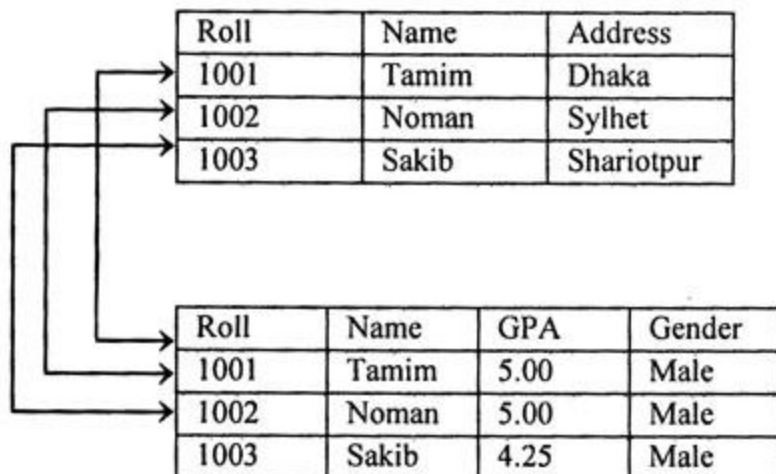**c** The data types of the two table mentioned in the stem is explained below:

Name of the field	Date type
Roll	Number
Name	Text
Address	Memo
GPA	Number
Gender	Text

Number : This data type is used for number based data. No letter can be written in this field. Only whole number and numbers with decimal points can be written.

Text: Generally, this data type is used for letter based data. Numbers can also be written with letters. 255 letters can be written at most.

Memo : This data type is required for descriptive writing. 65536 byte space is required for this field.

d One to one Relation is possible between the tables of the stem. The common field between the two files of the table is Roll. If any database is related to one record of one file with another record of one or more files– that is known as one to one relationship. There, Roll is considered the primary key between two tables to demonstrate the one to one Relation—

Roll	Name	Address
1001	Tamim	Dhaka
1002	Noman	Sylhet
1003	Sakib	Shariotpur

Roll	Name	GPA	Gender
1001	Tamim	5.00	Male
1002	Noman	5.00	Male
1003	Sakib	4.25	Male

Ques. ▶31

Result Table

Roll	Name	Absent Fine	GPA	Attendance
101	Jon	300.00	4,5	☑
102	Ron	500.00	5	
103	Tom	100.00	4	☑

[Milestone College, Dhaka]

a. What do you mean by Foreign key? 1
b. "Dynamic website is better than Static website" explain it. 2
c. Whose fine is equal or more than 300 in the mentioned stem, write down the SQL command for showing their names and rolls. 3
d. Explain the data type of various field in the mentioned table. 4

Answer to the question no. 31

a In relational table, if the primary key of a table is used on another table, then that key in accordance with the first table is the second table foreign key.

b Dynamic website data can change after loading and to create a dynamic website php MYSQL and database connection. User can easily communicate in dynamic website. On the other hand, static website data can not change after loading webpage. Only html language is needed to create this type of webpage. But user cannot communicate with this site. So for this reason dynamic website is better than static website.

c Whose Absent fine above 300 or equal show three name, Roll from Resut table in SQL command is shown below:

Select Name, Roll

From Result

Where absent Fine > = 300.

d Various datatype field is described below:

Roll, Absent fine, GPA : Those fields are number/Numeric. Numeric field with integer and fraction with/ without adding/ minus sign. But with this kind of data we can easily perform any mathematical operation.

Name : In above stem the table of Name field is text/character datayype. In this datatype we can use character, number symbols, in the text/character field. But in this kind of data we cannot perform any mathematical operation. Maximum 255 character/ digit/symbol can be used in this field.

Attendance: Attendance field is a yes/no or logical datatype. This field is used only to know Yes or No. Yes or No mean's True or False.

Ques. ▶32 Notice the following stem:

Roll	Name	City
101	Rifat	Khulna
102	Fahmid	Dhaka
103	Fahima	Hobigonj
104	Istiaq	Barisal

Table-1

Roll	Total Marks	Grade
101	800	A+
102	660	A–
103	775	A
104	800	A+

Table-2

[Bangladesh International School & College, Dhaka]

a. What is Sorting? 1
b. 'Database Index File is updated automatically' — explain. 2
c. Explain the data type focusing on the stem. 3
d. Examine the probability and advantage of creating relation of the two tables mentioned in the stem. 4

Answer to the question no. 32

a *Sorting* refers to ordering data in an increasing or decreasing fashion according to some linear relationship among the data items.

b In database indexing refers to the process of ordering data in logical order according to field. Creating an index on a field in a table creates another data structure which holds the field value, and a pointer to the record it relates to. This index structure is then sorted, allowing Binary Searches to be performed on it. A basic property of indexing is, when a new record is added the index file is automatically updated.

c In the stem there are two tables is given. The two tables are used for storing different types of data. The Table-1 has 3 fields which are Roll, Name and City. From the given value of Roll field we can say that the data type of Roll field might be number or numeric type. Number or numeric data type is used to store numbers in a data field. Arithmetic operation can be done in this field. Name and City of the Table-1 has the data type of Text. Text data type is used to store characters, numbers and special characters. Arithmetic operation is not possible in this field. From the Table-2 we can see that there are also three fields in the table. The Roll and Total Marks field has data type of number or numeric and the Grade has the data type of text.

d From the given stem we can see that there are two tables are shown. The first table has three data fields and the second table is also has two data fields. The fields of first table are Roll, Name, City and the second table has fields named Roll, Total Marks and Grade. So we can say that relation between two tables is possible. Because the two tables has a common field named Roll. As the Roll table is the primary key of both tables then we can say that the relation between the two table will be One-to-One.

Roll	Name	city		Roll	Total Marks	Grade
101	Rifat	Khulna	→	101	800	A⁺
102	Fahmid	Dhaka	→	102	660	A⁻
103	Fahima	Hobigonj	→	103	775	A
104	Istiaq	Barisal	→	104	800	A⁺

Relation establishes a connection between a pair of tables that are logically related to each other. A pair of tables is logically related via the data each contains. It helps to further refine table structures and minimize redundant data. As you establish a relationship between a pair of tables, you will inevitably make minor modifications to the table structures. These refinements will make the structures more efficient and minimize any redundant data that the tables may contain.

Ques. ▶33 ▶ Look at the tables —

Name	Roll	Date of Admission	Picture
Salma	161	25/06/2016	
Rimjim	162	27/06/2016	
Mimi	163	22/06/2016	

Table-1

Roll	GPA	Result
161	4.93	A
162	5.00	A+
163	4.63	A

Table-2

[Cantonment English School & College, Chattogram]

a. What is action query?   1
b. "Mobile number is a text type data". Explain.   2
c. Describe the data types used in the tables above.   3
d. Is it possible to establish relation between the two tables? Analyze.   4

Answer to the question no. 33

a Action queries are the queries that can add, change or delete multiple records at one time.

b Mobile number could be a field in the table of a database. The data type of their field can be number or numeric type. But the protect data type could be tent data type. Then it will categorized easily. And there is no need of arithmetic operation in this field. So this field could be tent data.

c In the stem there are two tables is given. From the Table–1 we can see that there are four field in the first table which are Name, Roll, Date of Admission and Picture. Here the data type for Name field with be tent type. It is used to input all character numbers or special characters. No arithmetic operation can be done in this type of field. The Roll numbers field can be number data type as well as text datatype. Number data type is used to store only numbers. And arithmetic operation can be done in this field. Date of Admission has the data type of data. It is used to store the time and data type. And the picture filed has the data type of OLE object type. And the Table–2 has three field such as Roll, LPA and Result. Here the ROM and LPA may be the number type of data and result will be text type of data.

d In the given stem we can see that there are two tables one given. In the Table–1 there are four fields named: Name, Roll, date of admission and picture. And Table–2 has 3 data fields such as Roll, LPA, Result. We know that, if we want to establish relation between two table than there with be needed common field in this situation hare is Roll. And the common filed must have the same datatype and size. And also we can observe that Roll field in Table–1 is the primary key in this table and roll in Table–2 is also a primary key is that table. We know that the relation between the primary keys of different table is called one-to-One relation.

Name	Roll	Date of Admission	Picture		Roll	GPA	Result
Salma	161	25/06/20169		→	161	43.93	A
Rimjim	162	27/06/2016		→	162	5.00	A+
Mimi	163	22/06/2016		→	163	4.63	A

Ques. ▶34 Observe the stem properly & give the answer given below.

Roll	Name	City		Roll	Total Marks	Grade
101	Rifat	Dhaka		101	800	A⁺
102	Fahmid	Khulna		102	750	A⁻
103	Tarek	Barisal		103	660	A
104	Anis	Sylhet		104	795	A⁺

Table-1   Table-2

[Mirzapur Cadet College, Tangail]

a. What is RDBMS?   1
b. Write the difference between field & Record.   2
c. Describe the data type of the field of table-1 & table-2.   3
d. How relation can be created between two tables & write advantages of creating table-Analyze it.   4

Answer to the question no. 34

a RDBMS means Relational Database Management System. RDBMS is a collection of program and capabilities that enable IT teams and others to create, update, administrate and otherwise interact with a relational database.

b Difference between field and record is given below:

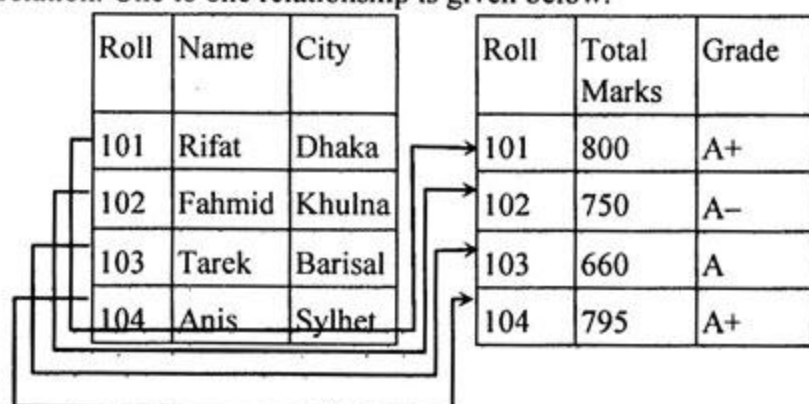| Field	Record
A sum of character make field.	Some fields which are related to each other can make record
A field is a small data unit in the table	A record is sum of field in the table
Have same data type in one field.	Have different data type in one record

c Descripton of two datatype is given below:

Number/Numeric datatype: table–1 and table–2 Number/Numeric fields are Roll, Total marks. In this datatype of field integer and fraction with/without adding/minus sign. But in this kind of data we can perform any mathematical operation.

Text/Character: table–1, table–2 text/character datatype is Name, city, grade. In this datatype we can use character/Number/Symbols, in the text/character field. Generally text field is of maximum- 255 digit. But in this dataype any mathematical operation cannot perform.

d According to the stem one to one relation is possible with table–1 and table–2. Because, if there is a record of table in a database related to a record in another table, the relationship between them is called one to one relation. Now it is said that this relation happens when two table primary key is connected with the another table– primary key.

We can see the table–1 Primary key is Roll and table–2 primary key is Roll. So two table Primary key is Roll and same data type. As result table–1 and table–2 can make one to one relation. One to one relationship is given below:

Roll	Name	City		Roll	Total Marks	Grade
101	Rifat	Dhaka		101	800	A+
102	Fahmid	Khulna		102	750	A–
103	Tarek	Barisal		103	660	A
104	Anis	Sylhet		104	795	A+

One to one relation

Benefits of making relation table is given below:

(i) Represent data fast and control it,

(ii) Data can be easily updated.

(iii) Reduce the data duplication in relational table.

(iv) Easy to find out data/record.

Ques. ▶ 35 Table-1

Item Code	Item Name
301	Pen
302	Pencil

Table-2

Item Code	Manufacturer	Unit Price	Quantity	Total
301	Matador	100/-	40	4000/-
302	Notoraj	200/-	60	12000/-

[Joypurhat Girls' Cadet College, Joypurhat]

a. What is Cipher text?   1

b. What are the methods to input data in database management?   2

c. Explain what problems would have occurred if there had been no "Item Code" field in table-2?   3

d. According to the stem what relation can be made with Table-1 and Table-2? Explain.   4

Answer to the question no. 35

a After encrypting the message that is not readable by human.

b There are a number of way to input data into a database management. Those methods are direct entry, form, import, SQL and Website or other application. Direct entry means directly into the table while its in data sheet view and SQL use to insert data. And most database management system allow you to import data from external sources.

c Above stem the table-1 and table-2. Table-1 fields are item code, Manufacturer, unit price, quantity, total.

So we can see both table one common field is item code. Item code can be related with two table. Because most be one common field between relational table. Data type, Field size and format must be the same for common field and must be a primary key field on at least one of the relational tables. The stem two table common field item code is a primary key. If those table had no 'Item code' field in the table-2. As a result table-1 and table-2 do not make relation to each others.

d According to the stem one to one relation can be made with table-1 and table-2 because- if there is a record of a table in a database related to a record in another table, the relationship between them is called one relation. Now it is said that this relation happens when the primary key is connected with the primary key. Here table-1 primary key is 'Item code' and table-2 primary key is "item code". Two table both primary key is same and same data type. So table-1 and table-2 make one-to-one relationship.

Table-1

Item Code	Item Name
301	Pen
302	Pencil

Table-2

Item Code	Manufacture	Unit Price	Quantity	Total
301	Matador	100/-	40	4000/-
302	Notoraj	200/-	60	12000/-

One to one relationship

Ques. ▶36 Notify the given stem and answer the question.

Roll No.	Division	Name	Address

Table : 1

Roll No.	Gender	Group	Result

Table : 2

a. What is tuple? 1
b. Write the difference between indexing and sorting. 2
c. Describe the data types of the four fields in table 2. 3
d. What kind of relationship is possible between the tables in the stem? Analysis with logic. 4

Answer to the question no. 36

a A tuple is a one record, some fields which are related to each other can make a record.

b Indexing and sorting difference between is given below:

Indexing	Sorting
1. Indexing is a database object, which keeps the table data unchanged to find the database data fast. One or more columns of the table can be arranged in an index file.	1. Sorting is the operation or method in a database where the desired data can be sorted according to a specific order.
2. Main purpose is to do query fast and get expected result.	2. Main purpose is arranged output data.
3. Indexing creates new files and require additional space for storage.	3. During sorting no new file created that's why no extra memory needed.

c The given stem table-2 data field are Roll No, Gender, Group & Result. This table data types describes is given below:

i. **Number/ Numeric:** Roll no, Result are both Number/ Numeric data type. Number can be used in numeric field with Integer and fraction with/ without adding/ minus sign/ This kind of data type can be easily perform any mathematical operations.

ii. **Text/Character:** Gender, Group are both. Text and character data type, text or character data type can use character, numbers symbols, in the text/ character field. But with this kind of data we cannot perform any mathematical operations.

d Above the stem table-1 and table-2 relationship is possible one to one relation. Because the table-1 Primary Key Roll no and table-2 Primary Key is roll no and there data type field same and unique. One to one relation is the relation of a table in a database related to a record in another table and one to one relation happens when the Primary Key is connected with the Primary Key.

Table-1

Roll No	Division	Name	Address
0010	Rangpur	Riaz	Savar
0011	Dhaka	Rakibul	Ashulia

Roll No	Gender	Group	Result
0010	Male	Science	4.50
0011	Female	Science	5.00

Figure: One to one relationship

Ques. ▶37 Observe the database table below and answer the following questions :

Roll	Name	Address

Student

Reg. No	Total Number	Grade	Roll

Result

a. What is geostationary satellite? 1
b. Mention *four points* on the difference of register and counter. 2
c. Which field(s) will act as primary or foreign key in *Student* and *Result* table? Explain. 3
d. Which type of relationship may be done between the tables mention in the stem? Analyze. 4

Answer to the question no. 37

a If the satellite is also made to rotate once in every 24 hours, it will seem to be in a fixed position in the sky with respect to the earth, such satellites are called geo-stationary satellites.

b Four points on the difference of register and counter is given below:

Register	Counter
A register is a digital circuit made by some flip-flop which can store a small amount of data.	A counter is a digital sequential logic device that will go through certain predefined states based on the application of the input pulse.
A register is used in memory devices as cache memory.	Counter is needed for giving timing signal.
A register temporarily stores data in the CPU.	Counter is used in event for counting electrical pulse.
A register stores different types of command language.	Counter is used for controlling different operations.

c Above given two tables are student and result. Student table have three fields, Roll, Name, Address. Here other fields may duplicate data but Roll Field data cannot duplicate data. Roll field data is always unique. That means a file which is unique or different and through which the relation between one or more files can be created by establishing a related database, is called primary key. So we can say the primary key of student table is Roll Field.

And another table is result table, here primary key of student table is used as a foreign key in result table. It is given below:

Primary Key   Foreign Key

Roll	Name	Address

Student

Reg. no	Total Number	Grade	Roll
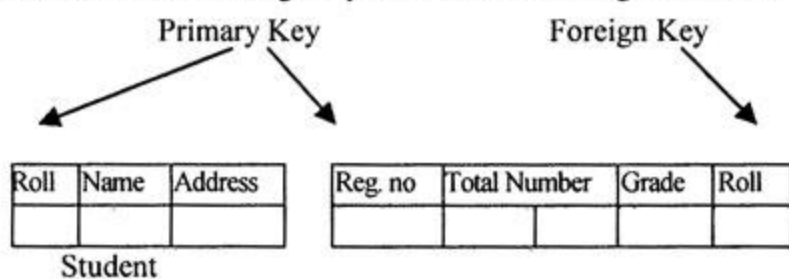
So we can say the foreign key of result table is Roll Field.

If the Primary Key of a table is used on another table, then that key in accordance with the first table is the second table's foreign key.

d One to many relationship is possible between the tables mentioned in the stem above. If a database contains a record of a table related to multiple record on one or more data tables, then the relation between them is called a one to many relationship. Here two table relation between Primary Key and Foreign Key creates one to many relationship. Student table Primary Key is 'Roll' and result table Foreign Key is 'Roll''. So, data types of both of the table are same and are not duplicate. So this condition is to make a relation between them.

Roll	Name	Address		Reg. No	Total Number	Grade	Roll
01	X	Dhaka		012018	85	A⁺	01
02	Y	Rangpur		012018	90	A⁺	01
03	Z	Dhaka		022018	85	A⁺	02
				022018	60	A⁻	02
				032018	70	A	03

One to many relationship

Ques. ▶38 Observe the following tables.

ID	Name	Age
001	Sakib	17
002	Zarif	17
003	Mrinal	18

Student Table

ID	Course Name	Course Fee (Taka)
001	Physics	500
002	ICT	600
003	Chemistry	700

Course Table

[Cumilla Cadet College, Cumilla]

a. What is OLE?   1
b. What are the difference between Data and Information?   2
c. What is SQL? Write down SQL command to display ID, Name and Age from "Student Table" whose age is less than 18.   3
d. What type of relation can be made between two tables in the stem? Give logic for your answer.   4

Answer to the question no. 38

a OLE means Object Linking Embeding. OLE is a datatype in database table. To add word, Images, text and graph to any field from different program object file it is used.

b Difference between data and information is given below:

Data	Information
Short form of information	Information is the result of processing data so that meaningful details can be derived
All data is not information	All information is data
Not always meaning full	Always meaningful

c Full form of SQL is structure query Language. It is a set of instructions or commands through when specific tasks can be performed in a particular way. Some SQL statement are DDL, DML, TCL and DCL. The biggest advantage of SQL is it can perform all tasks from the logical level.

Whose students age are under 18 years, their ID, Name and Age from the student table in SQL command is given below:

From student

Select Id, Name,

Age

Where Age<18;

d According to stem one to one relation is possible with table–1 and table–2. Because. If there is a recorded in a database related to accord in another table, the relationship between then is called one to one relation. Now if is said that this relation happens when the primary key is connected. With the primary key.

So we can see the stem two table–1 and table–2– primary key is ID. table–1 fields are ID, Name, and Age. another table–2 fields are ID, course Name, course fees. So there are two common fields of ID and it datatypes is same. As a result table–1 Primary key ID and table– 2 Primary key ID make a relationship between them this relation is called one to one relationship.

ID	Name	Age
001	Shakib	17
002	Zarif	17
003	Mrinal	18

ID	Course Name	Course Fee (Taka)
001	Physics	500
002	ICT	600
003	Chemistry	700

Ques. ▶39

Product_Code	Product_Name
001	Pendrive
002	Mouse
003	keyboard

Product-Code	Price (tk)
001	600
002	250
003	400

[Feni girls' Cadet College]

a. What is composite primary key?   1
b. Why Binary addition and Boolean addition is not same?   2

c. Identify the key field from the tables in the stem and write the difference between them. 3

d. Which types of relation is possible between the tables in the stem and write down sql commands for displaying Product_Code and Product_Name above tk 250. 4

Answer to the question no. 39

a The primary key that is composed due to Coordination of multiple field is called composite primary key.

b Using binary number to make binary add as the rules of mathematical is called Binary addition.

On the other hand, Boolean add is to implement for the boolean algebra's or operation to make boolean addition is called– Boolean add, Note that, in binary add used two, Number, 01. 0, an 1 is real binary number. But In boolean Algebra used 0, 1 number is not a binary number, It really indicates 0, and 1 – logic label. So for this reason binary add and book on add is not same.

c According in the stem will be identify key. field from the two table. Actually key field is used to establish a relation betwen. Identifying records and multiple result in files and database is colles key field. So according the key field definition, table–1. Key field is indicates product code. Product– code is a primary key field in the table–1. On the other hand, table–2 key field is indicates product-code. But product-code is define table–2 foreign key. If the Primary key of a table is used to another table, then that key in accordance with the first table is the second table's foreign key. Now the difference between Primary key and foreign key is given below:

Primary key	Foreign key
Primary key uniquely identify a record in the table.	Foreign key is a field in the table that is primary key in another table.
Primary key can't accept null values.	Foreign key can accept multiple null value.
By default, Primary key is clustered index and data in the database table is physically organized in the sequence of clustered index.	Foreign key do not automatically create an index, clustered or non-clustered. You can manually create an index on foreign key.
We can have only one Primary key in a table	We can have more than one foreign key in a table.

d According in the stem two tables can make one to one relation. Because the two table key field and data type is same, they can make one to one relation. table–1. Primary key field is Product-code and table–2 primary key field is product code. so there. are two table primary key is same. that so those two table can be made one to one relation.

Again, According to the stem two table, Product and price's above stem, there product-code, product Name for in two SQL command is below:

Select Product_code, Product_Name

From table 1, table –2

Where price> = 250

and tablet 1. product_code = table–2. Product_code.

Ques. ▶40 A Relational Database Management System (RDBMS) is a software system that provides access to a relational database. The software system is a collection of software applications that can be used to create, maintain, manage and use the database. A "relational database" is a database structured on the "relational" model. Data are stored and presented in a tabular format, organized in rows and columns with one record per row.

[Faujdarhat Cadet College, Chittagong]

a. What is database? 1

b. What is the difference between primary key and foreign key? 2

c. Write down the applications of Relational Database Management System (RDBMS). 3

d. Explain all types of relations among data table? 4

Answer to the question no. 40

a Data mean's information and base means assembly. A database is a huge information assembly of a relational subject. Database is a process for storing huge amounts of information.

b

Primary key	Foreign key
Primary key uniquely identify a record in the table.	Foreign key is a field in the table that is primary key in another table.
Primary key can't accept null values.	Foreign key can accept multiple null value.
By default, Primary key is clustered index and data in the database table is physically organized in the sequence of clustered index.	Foreign key do not automatically create an index, clustered or non-clustered. You can manually create an index on foreign key.
We can have only one Primary key in a table	We can have more than one foreign key in a table.

c Appreciation of RDBMS is given below:

• Online office management.

• Calculation and data preservation in the banking and insurance sector.

• Ticket reservation of air, rail, hotel etc.

• Flight scheduling, e-commerce

• Data preservation of the patients in the hospital

• Budget formulation and accounting management

• Population-base data preservation.

• Human resource management of the large organizations.

• Research and survey.

• Data preservation of student management, teachers management of online-based educational institution.

d There are different relation in data table description is given below:

1. **One to One relation :** If a database contains a record of a table related to multiple records on one or more data tables, then the relation between them is called a one to many relation. Now it is said that this relation happens when the primary key is connected with the primary key.

2. **One to Many Relation :** If a database contains a record of a table related to multiple records on one or more data tables, then the relation between them is called a one to many relationship. Note that relation between Primary Key and Foreign key Creates One to may Relationship.

3. **Many to One Relation:** If multiple records on a data table, is related to one record on one or a range of data tables then their attachment relation is called many to one relationship. it is the opposite of one to many relation. A connection between foreign key and primary key created one to many relation.

4. **Many to Many Relation:** relationship between multiple records in a table with other records in another table is called many to many relation. When there is more than one matching records between two tables then that is called many to many relation. Many to many relation needs two foreign key. At least three tables are needed for two Foreign Keys. To establish this relationship an extra third table is needed called Junction Table. Junction Table converts the Primary key of two tables into Foreign Key. As a result, one of the primary keys o a table will create one to many relation with a foreign key in the junction table. As a result, many to many relation will be created between the two tables of the table.

Ques. ▶41

Table-1		
ID	Name	Address
1001	Shahalam	Sylhet
1002	Sahin	Dhaka
1003	Afrad	Rangpur

Table-2		
SL	Designation	Salary
1	Manager	40000
2	Officer	25000
3	Accountant	20000

The Name and Designation are instructed to display from tables for those persons who have 40000 or above salary. The person named 'A' has done this with the help of command maintaining conditions but for this he has taken long time. The person named 'B' says if we make an important file, the job will be completed fast but it will take time in data entry.

[Sylhet Cadet College, Sylhet]

a. What does RDB MS mean? 1
b. Why SQL is called the weapon of database? 2
c. Make a database relation adding necessary column with the above tables. 3
d. Are you agreed with the information given by 'B'. Analyze. 4

Answer to the question no. 41

a See the answer no. 4(a).

b See the answer no. 4(b).

c Similar as answer no. 4(c).

d Similar as answer no. 4(d).

Ques. ▶42

ID No	Name	City
001	Farhan	Dhaka
002	Asif	Khulna
003	Urfat	Dhaka

Table 01 : Customer

ID No	Name	City
001	Processor	5500
002	Keyboard	550
003	Graphics card	2800

Table 02 : Sales *[Jhenidah Cadet College, Jhenidah]*

a. What is entity? 1
b. Is it possible, a primary key can act as a foreign key?— Describe how? 2
c. How main server acts in a distributed database system? Explain with proper figure. 3
d. Is it possible to make relation between the tables of the stem?— Analyze with example. 4

Answer to the question no. 42

a An entity is any object in the system that we want to model and store information abocetit. Some specific example of entities are Employee, student etc.

b The primary key of one table may also help to identify records in other tables, and be part of the second table's primary key. The instance of the first table's Primary key in the second table is referred to as a foreign key. Example in one to one relation primary key is the first table work as a second table foreign key.

c Distributed database is a system which make a connection between a centrally controlled server and multiple database system via a network. In this process there is a central server and under this server one or more sub-server or workstation can be included. Central server, sub-server/workstation each has its own database. Database workstations are located in different places, In this process every workstation can independently perform database correction and submission. Central workstations of central server are updated according to the current situation of the database. Central database of server can change sub-server database information, data description, language etc. In distributed database process, central database of the server can collect information from the workstation's database and also control them. In distributed database management, client and server process is given priority because workstations an have one or more clients.
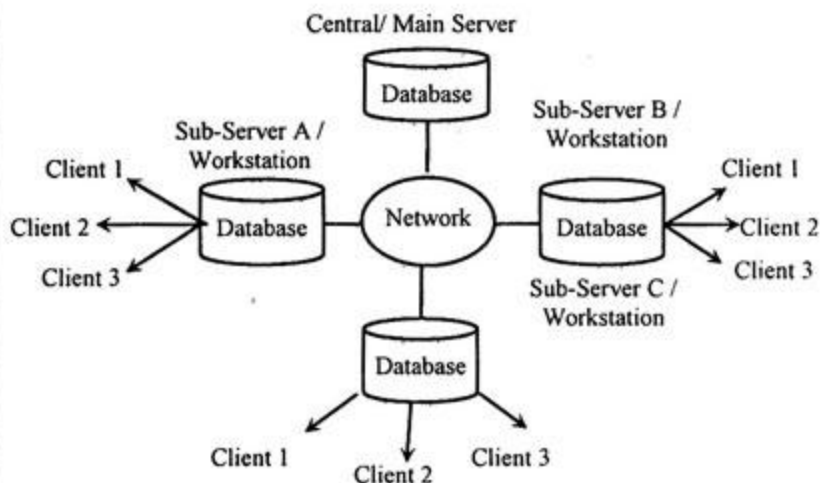
Fig: Distribution Database Management

T0001	C0004	11-10-16	12-10-16
T0002	C0001	12-10-16	13-10-16
T0004	C0001	10-10-16	11-10-16
FK		FK	

d **Indexing:** Without changing the serial number of the input record in data file, the records. Sorted in a logical order and this method is called indexing.

Sorting : Sorting meaning arranging data. Sorting means arranging the data table data by a given field.

The difference between indexing and sorting is given below:

Indexing	Sorting
1. Indexing is a database object, which keeps the table data unchanged to find the database data fast. One or more columns of the table can be arranged in an index file.	1. Sorting is the operation or method in a database where the desired data can be sorted according to a specific order.
2. Main purpose is to do query fast and get expected result.	2. Main purpose is arranged output data.
3. Indexing creates new files and require additional space for storage.	3. During sorting no new file created that's why no extra memory needed.
4. indexing is the arrangement of the records of the data tables by maintaining the original table for the arrangement of the data table records, arranged according to a fixed single or multiple fields.	4. Sorting is the data table records sorted by a given field.
5. If the data file is sorted in index method, the serial number of the original data file record does not change.	5. If the data file is sorted in sorting method, the serial number of the original data file record will be changed.

Ques. ▶43 In library of Barishal Cadet College, there are many books recently have been bought. Here, there is a table named Books (Title, Writer, Editor, Price, Publication, ISNB). Students take these books using ID card. In ID Card (Name, Class, Session, Group, Address, Roll Number).

[Barishal Cadet College, Barishal]

a. What is Query? 1
b. Write the rules of creating relation between two tables. 2
c. Draw two tables as introduced in stem. Design the relationship between two tables. 3
d. What is indexing and sorting? Write the difference between these. 4

Answer to the question no. 43

a To search any information from numerous data of the database by giving any condition is known a query.

b **Relational Condition between Databases :**

1. There must be one common field between relational tables. Data type, Field size and Format must be the same for common field.

2. There must be a primary key field on at least one of the relational tables.

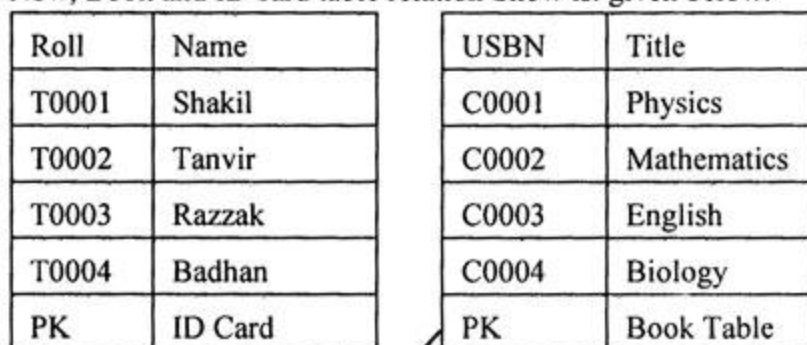**c** According in the stem two table is given below:

Book table

Title	Writer	Editor	Price	Publication	ISBN

Name	Class	Session	Group	Address	Roll

ID card Table

Here, Book table in primary key is ISBN. ID card table Primary key is roll. So there two table have any common field. As result two table can not make directly any data relation. If we want create two table relation, then we. Most create a junction table. Using Junction table to make a reaction is called many to many relation.

Now, Book and ID card table relation Show is. given below:

Roll	Name
T0001	Shakil
T0002	Tanvir
T0003	Razzak
T0004	Badhan
PK	ID Card

USBN	Title
C0001	Physics
C0002	Mathematics
C0003	English
C0004	Biology
PK	Book Table

Roll	ISBN	Issue Date	Return Date
T0001	C0002	10-10-16	11-10-16

Ques. ▶44

There is a database named "My_Databse". A table named "Dept" (Dept_ID, Dept_Name, Location, Phone) and there are several information into it. *[Barishal Cadet College, Barishal]*

a. What is Data Encryption? 1
b. What are the difference among DDL, DCL, DML in SQL? 2
c. Write SQL format to find after inserting 5 data in it— 3
   i. All the information from Dept ascending by Dept_ID.
   ii. Find the Dept_Name, Location from the table whose Dept_ID is more than 200.
   iii. Write delete query and update query for a sample data.
d. How many types of relationship in database. Explain with examples. 4

Answer to the question no. 44

a To ensure the security of the data, the process by which data is changed in a special way before sending the data from source to destination is called data encryption.

b Difference between DDL, DML, DCL is given below:

	Create	Create new table, View, Sequence, Index, Synonyms.
	Alter	Change Structure of Created table, View, Index, Sequence and Synonyms.
	Drop	Delete the created Table, View, Index, Sequence and Synonyms.
DDL	Rename	Change the name of created Table, View, Index, Sequence and Synonyms.
	Truncate	It is used to delete data but Keeps the Table structure and Constraints in order
	Select	Data can be retrieve from database by this command.
	Insert	Used to Add data.
DML	Update	Used to change data.
	Delete	Used to delete data.
DCL	Grant	Provides Privilege to database use.
	Revoke	Cancels Privilege of database user.

c Which the contains table five record in the stem is given below:

Dept id	Dept Name	Location	Phone
211	Admin	Dhaka	56565656
210	HRM	Dhaka	56565656
103	Sales	Dhaka	56565656
204	Marketing	Dhaka	56565656
505	Purchase	Dhaka	56565656

SQL command to sorting Dept_ID table is given below:

SELECT*

FROM Dept

ORDER BY Dept id ASC:

ii) Whose Dept–ID is 200 above, more there than, SQL command is given below:

SLECT Dept-Name, Location

From Dept

Where Dept-id>200;

iii) To make Purchase department to production the SQL Command is given below:

update Dept

set Dept – name=" production"

where Dept – name=" Purchase";

To delete Admin table SQL Command:

Delete from Dept.

Where Dept Name=" Admin";

d There four data table relation description is given below:

1. **One to One relation:** If there is a record of a table in a database related to a record in another table, the relationship between them is called one to one relation. Now it is said that this relation happens when the primary key is connected with the primary key.

2. **One to Many Relation:** If a database contains a record of a table related to multiple records on one or more data tables, then the relation between them is called a one to many relationship. Note that relation between Primary Key and Foreign key Creates one to may Relationship. Example: Think about the previous College. Suppose some teachers left this college. So according to new rules one teacher can take one or more courses but the same course cannot be taken by more than one teacher. So between Teachers and course mapping cardinality is One to Many.

3. **Many of one relation :** If multiple records on a data table, is related to one record on one or a range of data tables then their attachment relation is called many to one relationship. It is the opposite of one to many Relation. A connection between Foreign key and primary key creates one to many relation. Example: After one year many teachers were recruited in the college. So according to the new rules a teacher cannot teachers were recruited in that college. So according to the new rules a teacher cannot take more than one course. But a course can be shared by many teacher. In this situation Teacher and course entity set cardinality is many to one.

4. **Many to many relation:** Relationship between multiple records in a table with other records in another table is called many to many relation. When there is more than one matching records between two tables then that is called many to many relation. Many to many relation needs two foreign key. At least three tables are needed for two foreign keys. To establish this relationship an extra third table is needed called Junction Table. Junction table converts the primary key of two tables into foreign key. As a result, one of the primary keys of a table will create one to many relation with a foreign key in the junction table. As a result, many to many relation will be created between the two tables of the table. Example: After some days Syllabus is changed from the Broad. As a result it increase the number of courses. Therefore, because of the lesser number of teachers, new rules were made. A teacher can take many courses and one course can be shared by many teachers. In this situation between teacher and course entity set cardinality is many to many.