

## Informatics Practices Notes

Q1.

### Computer Networking & Open Source Concepts -

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#### Definitions:-

- a. **MAC Address:** - The (12 digit hexadecimal) hardware address of the networks card is called MAC Address which is assigned by the manufacturer e.g. 10:B5:03:63:2E: FC.
- b. **IP Address:** - Every machine or node on a TCP/IP network has a unique identifying number called an IP Address e.g. 192.168.1.1.
- c. **Internet:** - Interconnection of various World Wide Networks is called Internet. It is of 2 Types Internet (Inter connections of networks of different companies) & (Intranet Inter connections of networks of same company e.g. LIC).
- d. **URL:** - Uniform Resource Locator is the complete address of a document on the web, whereas **DNS** Domain Name specifies the location of document's web server. Domain Name is a component of the URL used to access websites. E.g. (<http://www.cbse.nic.in/index.html> is URL and [www.cbse.nic.in](http://www.cbse.nic.in) is Domain Name).
- e. **PAN:-** Personal Area Network A PAN is a network of Communicating devices in the area of an individual. When you have to transfer songs from one cell phone to another, you set up a PAN of two phones. A PAN can be set up using guided media (USB cable) or unguided media (Bluetooth, Infrared).
- f. **LAN:-** Small computer network spread over a small area up to 2 KM is called **LAN**. (Like some schools have independent LANs in each computer lab.) A LAN can be set up using wired media (UTP cables, Co-axial cables etc.) or wireless media (Infrared, radio waves). If a LAN is setup using unguided media, it is known as WLAN (wireless LAN).
- g. **MAN:** - A Metropolitan Area Network is a network of computing/communicating devices within a city. It can cover an area of a few KMs to a few 100 KMs. A network of schools, or banks, or Government offices etc., within a city, are examples of MANs. A MAN is usually formed by interconnecting a number of LANs and individual computers. All types of communication media (guided and unguided) are used to set up a MAN.
- h. **WAN:** - A Wide Area Network is a network of computing/communicating devices crossing the limits of a city, country, or continent. It can cover an area of over hundreds of kilometer radius. A network of ATMs, BANKs, National Government Offices, International Organizations' Offices etc. All types of communication media (guided and unguided) are used to set up a WAN.
- i. **MODEM:** - Modulator Demodulator allows our PC to connect & communicate with other computers via telephone line. It converts digital signals into analog signals & vice-versa.

- j. **Repeater**: - A repeater is a device that amplifies a signal being transmitted on the network. It is installed between O2 devices when the connecting distance is more than 80 mts.
- k. **HUB**: - It is an h/w network device used to connect several computers together. They are O2 types Active & Passive.
- l. **Router**: - It is an h/w network device used to connect O2 network having different protocols.
- m. **Protocols**: - A protocol is a set of standardized rules for data packets, techniques for detecting & correcting errors and so on.
- n. **STAR topology**: - **Advantages** (\* It has many no. of concentration points. \* One device per connection. \* Simple access protocols). **Disadvantages** (\* More cable length. \* Difficult to expand. \* Central node dependency.)
- o. **BUS topology**: - **Advantages** (\* Short cable length. \* Resistance Architecture. \* Easy to expand). **Disadvantages** (\* Fault diagnosis difficult. \* Repeater configuration. \* Data Collision.)
- p. **TREE topology**: - Tree topology is a combination of bus and star topologies. It is used to combine multiple star topology networks. All the stars are connected together like a bus. This bus-star hybrid approach supports future expandability of the network.
- q. **Network Security**: - It refers to making efforts to make sure that only legal or authorized users & programs gain access to network or network resources.  
Various protection methods (Authorization, Authentication, Encrypted, Smart cards, Biometric systems, Firewall)
- r. **Network intrusion problems are (Network Threats):-**
  - **Snooping** (refers to unauthorized access of someone else's data, email, computer activity or data communication).
  - **Eavesdropping** (is the act of secretly listening / intercepting someone else's private communication / data/ information).
  - **Denial-of-service** (Attacks that prevent the legitimate users of the system, from accessing the resources information or capabilities of the system).
- s. **OSS**: - **Open Source Software** is a software available with source code & permission to change / edit/ redistribute & impose no further restrictions on product or its usage. (e.g. LINUX [operating System], PHP[Programming & Web Designing language], Python[Programming Language], Apache[Server Programming], MySQL[RDBMS], Office.org[Office suit]).
- t. **ODF**: - Open Document Format is an Open, XML base file format.
- u. **Unicode**: - It is a single standard code which could cater to all world's languages and it was UNICODE. It is represented in 3 encoding forms a 32-bits, a 16-bits & a 8-bits. **Advantages**(\* Single version of S/w were developed. \* It ensures platform, vendor & application independence. \* It allows data to be transported through several different systems without distortion.)
- v. **FONT Types**: - **Post Script font** consists of two parts which are both necessary for the font to be properly printed and displayed on screen. **True type fonts** contain both the screen and printer font data in a single component. **Open type fonts** support multiple platforms

and expanded character sets. On the basis of their configuration, **fonts are categorized as static fonts and dynamic fonts.**

**w. Abbreviations :-**

<b>MAC</b>	Media Access Control
<b>IP</b>	Internet Protocol
<b>URL</b>	Uniform Resource Locator
<b>DNS</b>	Domain Name System
<b>PAN</b>	Personal Area Network
<b>LAN</b>	Local Area Network
<b>MAN</b>	Metropolitan Area Network
<b>WAN</b>	Wide Area Network
<b>DoS</b>	Denial Of Service
<b>OSS</b>	Open Source Software
<b>FLOSS</b>	Free Libre Open Source Software
<b>ODF</b>	Open Document Format
<b>XML</b>	extensible Markup Language
<b>HTML</b>	Hyper Text Markup Language
<b>NIU</b>	Network Interface Unit
<b>TAP</b>	Terminal Access Point
<b>ISCII</b>	Indian Standard Code for Information Interchange.
<b>bps</b>	Bits per second
<b>BPS</b>	Bytes per second
<b>FM</b>	Frequency Module
<b>AM</b>	Amplitude Module
<b>NFS</b>	Network File System
<b>MODEM</b>	Modulation Demodulation
<b>FTP</b>	File Transfer Protocol
<b>TCP / IP</b>	Transmission Control Protocol / Internet Protocol
<b>OSI</b>	Open System Initiative
<b>FSF</b>	Free Software Foundation
<b>GNU</b>	Gnu's Not Unix
<b>GPL</b>	General Public License
<b>W3C</b>	World Wide Web Consortium
<b>TTF</b>	True Type Fonts.
<b>OTF</b>	Open Type Fonts
<b>HTTP</b>	Hyper Text Transfer Protocol
<b>SMTP</b>	Simple Mail Transfer Protocol
<b>FTP</b>	File Transfer Protocol

**Types of Questions for revision.**

1. The 'Chalchitra' theatre has a computer network. The network is in one building.
  - (i) Name this type of network (out of LAN/MAN/WAN). Ans. LAN
  - (ii) Name one communication channel that can be used for fast communication between workstations of the network. Ans. Optical fiber cable
2. Explain in brief any 2 security threats to Computer networks.

**Ans.** i. **Denial of service attack:** It is an attempt to make one or more network resources unavailable to their legitimate users.

ii. **Snooping:** It is gaining unauthorized access to another person's or organization's data.

3. Write the advantages of using Unicode to represent text.

**Ans.** Unicode encoding standard provides the basis for processing, storage and interchange of text data in any language in all modern software and information technology protocols.

4. Write one example each of URL and IP address.

**Ans.** URL <http://www.cbse.nic.in/welcome.htm> IP address 192.168.1.1.

5. Mr. John wants to prevent unauthorized access to/from his company's local area network. Write the name of a system (software/ hardware), which he should install to do the same.

**Ans.** He should install Firewall

6. Which of the following are open source software's : GNU, MS-Office, BOSS, Windows OS

**Ans.** GNU, BOSS

7. Name the government organization that contributes to the growth of FOSS in India.

**Ans.** National Resource Centre for Free and Open Source Software (NRCFOSS) is the government organization that contributes to the growth of FOSS in India.

8. Read the given activities carefully and mention in front of the activity whether that activity is snooping or eavesdropping:

- i. Getting someone's login information by casually watching what he/she is typing.
- ii. Setting up unauthorized parallel telephone lines
- iii. Installing some software/hardware which captures the data while on its way.
- iv. Reading the files on someone's computer in an unauthorized manner

**Ans.** i. Snooping ii. Eavesdropping iii. Eavesdropping iv. Snooping

9. Kristen has typed the following text in the address bar:

<http://www.cbse-international.com/help.htm>

Explain to her the main concept of URL and Domain name with reference to the example given above.

**Ans.** URL (Uniform Resource Locator) is the complete address of a document on the web, whereas a domain name specifies the location of document's web server. A domain name is a component of the URL used to access web sites.

For example the web address <http://www.cbse-international.com/help.htm> is a URL. In this URL [www.cbse-international.com](http://www.cbse-international.com) is the domain name.

10. Chanakya has to write a paragraph in English on Nobel laureates as a part of his holiday homework. He is using a software in which he types the text in Hindi and the software automatically converts the text into English. For example, if he types "नोबेल प्राइज इस गिवेन इन ससक्स कैटेगिरीज" the software converts it into "Nobel Prize is given in six categories". What kind of text entry is it – phonetic text entry OR key map based text entry? How is it different from the other kind of text entry?

**Ans :-** It is phonetic text entry. It is different from key map based text entry as in the key map based text entry keyboard keys are mapped to specific characters using a key map whereas in phonetic text entry text translation is done by some software based on probable pronunciation of the entered text.

**E-Governance:-** It refers to application of electronic means in governance with an aim of fulfilling the requirements of common man at affordable costs & in fastest possible time.

Social impacts of E-governance:-

- Improved the efficiency of administration & service delivery.
- Reduced waiting time.
- Reduced cost.
- Increased public participation.
- Increased transparency.

E-Governance websites :-

- [www.incometaxindia.gov.in](http://www.incometaxindia.gov.in)
- [www.indiancourts.nic.in](http://www.indiancourts.nic.in)
- [www.rti.gov.in](http://www.rti.gov.in)
- [www.India.gov.in](http://www.India.gov.in)
- [www.drdo.nic.in](http://www.drdo.nic.in)

**E-business :-** It refers to any form of transaction (exchange) that uses an electronic medium to facilitate the transaction.

Social impacts:-

- Reduction in transaction & costs.
- Un-shortened supply chain.
- Improved service.
- Increased productivity.
- Access to international markets.

E-Business Websites:-

- [www.ircctc.co.in](http://www.ircctc.co.in)
- [www.licindia.com](http://www.licindia.com)
- [www.ebay.in](http://www.ebay.in)
- [www.amazon.com](http://www.amazon.com)
- [www.yatra.com](http://www.yatra.com)

**E-Learning:-** It is a flexible term used to describe a means of teaching through technology such as a network, browser, CDROM or DVD multimedia platform.

Social Impacts:-

- Availability of same course to millions.
- Boon for working class.
- Apprehensive Employers.
- Cultural differences does not affect.
- High Dropout rate.

Websites:-

- [www.moodle.org](http://www.moodle.org)
- [www.w3schools.com](http://www.w3schools.com)
- [www.ncert.nic.in](http://www.ncert.nic.in)

**Front End:-** It is the user-interface which interact with the user and collects inputs from the user. E.g. NetBeans Java Form.

**Back End:-** this remains hidden from user and its function is to store the data in the database & processes the user request as received by the front end. E.g. MySQL, Oracle, MS Access etc.

Q. Choose appropriate controls for the given options:-

S.no.	Control used to	Control
1	Enter Name, Address & Salary-	Text Box
2	Select Gender (Male / Female)-	Radio Button
3	Select Department from List -	List Box / Combo Box
4	Choose Hobbies from list -	Check Box / List Box
5	Message in front of Text Field-	Label
6	Choose more than one subject-	List Box
7	Entering Marks-	Text Box
8	Enter Adm. No.-	Text Box
9	Select Stream-	Radio Button / Combo Box
10	Clear the form-	Command Button
11	Submit-	Command Button
12	Select Subjects-	Check Box / List Box

1. Bachpan Toys' is a small company manufacturing toys. They have decided that it would be beneficial to the company to create a website which would allow customers to order toys on-line. State how 'Bachpan Toys' would benefit from the website.

**Ans:-** Through online marketing (e-business) they can reach to many customers of far away places in a cost effective manner. Also there is no need to incur huge cost of setting up a shop/store to sell items.

2. Which of the following is/are the advantage(s) of e-Governance

- i) technology makes governance speedier
- ii) Computer literacy and basic Internet usage is not required.
- iii) governance is made transparent, that is most of the information is available to public.

**Ans. i ) and iii)**

3. What is the role of a good back-end in an IT application?

**Ans.** A good back-end ensures sustainability, efficiency and easy modification of the application.

4. Identify e-Governance and e-Learning applications from the following:

- On-line experiments in a virtual laboratory of a college.
- On-line application submission for change of address in the passport.
- On-line bill payment of Water Charges to Jal Board of any state.
- On-line tutorials for physics.

**Ans:- E-Governance:**

- i) On-line bill payment of Water Charges to Jal Board.
- ii) On-line application submission for change of address in the passport

**e-Learning:**

- iii) On-line experiments in a virtual laboratory of a college.
- iv) On-line tutorials for physics.

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## MySQL Basic Commands

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**Database Concepts:-**

**Database:** - An Organised collection of data is Database.

**Relational Database:** - A Database in which the data in the form of relations (i.e. tables) is known as Relational Database.

**RDBMS:** - A DBMS used to manage Relational Databases is called RDBMS e.g. Oracle, MySQL etc.

### Advantages of DBMS:-

- Redundancy can be controlled.
- Inconsistence can be avoided.
- Data can be shared.
- Security restrictions can be applied.

**MySQL:** - It is an Open Source RDBMS Software & is available free of cost.

**Relation / Table:** - A table is 2D representation of Data arranged in rows & columns.

**Row** is also known as tuple.

**Column** is also known as attribute.

**Key:** - A column or a combination of columns which can be used to identify one or more rows (tuples) in a table is called a key of the table.

**Candidate Key:** - A column having unique set of values in all the rows / tuples is called candidate key.

**Primary Key:** - The candidate key used to identify each row of a relation is called Primary Key.

**Alternate Key:** - the candidate key which can be used to identify each row of a relation other than primary key is called Alternate Key.

**Degree:** - No. of columns or attributes are known as Degree.

**Cardinality:** - No. of rows / tuples in a tables is known as cardinality.

**SQL:- Structured Query Language** It is the language used to manipulate & manage databases & tables within them using a RDBMS.

**DDL (Data Definition Language)** This category of commands deals with the structure of tables and databases.

**DML (Data Manipulation Language)** This category of commands deals with the contents of the table e.g. Insert, Update, Delete and Select.

**DCL (Data Control Language)** This category of commands deal with controlling the access to database & tables e.g. Grant, Revoke etc.

### Database-Level

```
DROP DATABASE databaseName ;           -- Delete the database
e.g. DROP DATABASE school;

CREATE DATABASE databaseName ;         -- Create a new database
e.g. CREATE DATABASE school;

SHOW DATABASES;                          -- Show all the databases in this
server

USE databaseName;                       -- Set the default (current) database
e.g. Use School;

SELECT DATABASE ;                        -- Show the default database
```

### Table-Level

```
DROP TABLE tableName ;
Drop Table Student;

CREATE TABLE tableName (
    columnName columnType columnAttribute,.....
)
CREATE TABLE Student
( schno int(5) primary key,
  Name char(25) not null,
  Dob date );
```

**SHOW TABLES;** -- Show all the tables in the database

**DESCRIBE** *tableName* -- Describe the details for a table  
**e.g. DESCRIBE student;**

**ALTER TABLE** *tableName* **Modify** ... -- Modify a table  
**e.g. ALTER TABLE student Modify** name char (35)not null;

**ALTER TABLE** *tableName* **ADD** *columnDefinition*  
**e.g. ALTER TABLE student ADD** address char(40);

**ALTER TABLE** *tableName* **DROP** *columnName*  
**e.g. ALTER TABLE student DROP** address;

#### Row-Level

**INSERT INTO** *tableName*  
**VALUES** (*column1Value*, *column2Value*,...) -- Insert on all Columns

**e.g. INSERT INTO Student**  
**VALUES** (1001, 'Rajesh','12-Sep-1998');

**INSERT INTO** *tableName* (*column1Name*, ..., *columnNName*)  
**VALUES** (*column1Value*, ..., *columnNValue*) -- Insert on selected Columns

**e.g. INSERT INTO Student** (*schno*, *name*)  
**VALUES** (1002, 'Amit');

**DELETE**  
**FROM** *tableName*  
**WHERE** *criteria*

**e.g. DELETE**  
**FROM** *Student*  
**WHERE** *schno*=1002

**UPDATE** *tableName*  
**SET** *columnName* = *expr*  
**WHERE** *criteria*

**e.g. UPDATE Student**  
**SET** *name* = 'Amit Sharma'  
**WHERE** *schno*=1002 ;

**SELECT** \* | *column1Name*, ..., *columnNName*  
**FROM** *tableName*  
**WHERE** *criteria*  
**GROUP BY** *columnName*  
**ORDER BY** *columnName* ASC|DESC  
**HAVING** *groupConstraints* ;



**Questions:-**

1. Consider the table 'empsalary'. To select tuples with some salary, Siddharth has written the following erroneous SQL statement:

**SELECT ID, Salary FROM empsalary WHERE**

**Salary = something;**

Write the correct SQL statement

ID	Salary
101	43000
102	NULL
104	56000
107	NULL

Ans:- **SELECT ID, Salary FROM empsalary WHERE Salary is NOT NULL;**

2. While creating the table Student last week, Ms. Sharma forgot to include the column Game Played. Now write a command to insert the Game Played column with VARCHAR data type and 30 size into the Student table?

**Ans.** Alter Table Student Add (Game\_Played VARCHAR(30));

3. In 'Marks' column of 'Student' table, for Rollnumber 2, the Class Teacher entered the marks as 45. However there was a totaling error and the student has got her marks increased by 5. Which MySQL command should she use to change the marks in 'Student' table.

**Ans.** UPDATE command.

4. An attribute A of datatype varchar(20) has the value "Amit". The attribute B of datatype char(20) has value "Karanita". How many characters are occupied in attribute A? How many characters are occupied in attribute B?

**Ans.** 4, 20

5. Saumya had previously created a table named 'Product' in a database using MySQL. Later on she forgot the table structure. Suggest to her the suitable MySQL command through which she can check the structure of the already created table.

**Ans.** Describe Product;

6. Roli wants to list the names of all the tables in her database named 'Gadgets'. Which command (s) she should use to get the desired result.

**Ans.** Show tables;

7. Amit works as a database administrator in a Multinational bank. He wants to undo the changes made in the current transaction. Suggest to him a suitable MySQL command for the same.

**Ans.** Rollback;

8. Distinguish between ALTER TABLE and UPDATE commands of MySQL.

**Ans:-** ALTER is a DDL (Data Definition Language) statement. Whereas UPDATE is a DML (Data Manipulation Language) statement. One is used to update the structure of the table (add/remove field/index etc. ). Whereas UPDATE is used to update data.

9. A table FUNFOOD has 13 rows and 17 columns. What is the cardinality and degree of this table?

**Ans:-** Cardinality(No. of Rows in a table) – 13

Degree(No. of Columns in a table) – 17

10. Table Student has 4 rows & 2 columns. Table Marks has 2 rows & 3 columns. What will be the cardinality & degree of Cartesian product of both the table.

**Ans:-** Cardinality (Product of rows of both the tables) –  $4 \times 2 = 8$

Degree (Sum of columns of both the table) –  $2 + 3 = 5$

**E.g. of Select Commands**

- **Select \***  
**From** student;

- **Select** rollno, name  
**From** student;
- **Select** rollno, name  
**From** student  
**where** rollno = 112;
- **Select** rollno, name  
**From** student  
**Where** rollno>=12  
**Order by** rollno desc ;

#### Various clauses of Select Command

- **DISTINCT**  
**Select** DISTINCT(Publisher)  
**From** Books; {This keyword display the given column each value 1 time only}
- **BETWEEN ..... AND .....**  
**Select** \*  
**From** Books  
**Where** price **Between** 250 **AND** 500; {Define the range of values}
- **IN (..... , ..... , .....)**  
**Select** \*  
**From** Books  
**Where** Publisher **IN** ('BPB','TechMedia'); {Defines Multiple option}
- **LIKE**  
**Select** \*  
**From** Books  
**Where** Publisher **Like** '%A'; {Define the look alike values}
- **NULL, NOT NULL**  
**Select** \*  
**From** student  
**Where** issuedate **IS NOT NULL** **AND** Returndate **IS NULL** ;

#### Database LOANS

Table- Loan\_Accts

<u>AccNo</u>	<u>Cust_Name</u>	<u>Loan_Amt</u>	<u>Instl</u>	<u>Int_Rt</u>	<u>St_Dt</u>	<u>Interest</u>
1	R.K.Gupta	300000	36	12.00	19-07-2009	
2	S.P.Sharma	500000	48	10.00	22-03-2008	
3	K.P.Jain	300000	36	NULL	08-03-2007	
4	M.P.Yadav	800000	60	10.00	06-12-2008	
5	S.P.Sinha	200000	36	12.50	03-01-2010	
6	P.Sharma	700000	60	12.50	05-06-2008	
7	K.S.Dhall	500000	48	NULL	05-03-2008	

#### Write SQL Commands

1. Create the database & use it.

**Ans.** SQL> Create Database Loans;

SQL> Use Loans;

2. Create the table loan\_Accts & inserts the rows.

**Ans.** CREATE TABLE Loan\_Accts

```
( AccNo          Int (2) ,  
  Cust_Name      Varchar(30),  
  Loan_Amt       Int(7),  
  Instl          Int(3),  
  Int_RT         Decimal(5,2),  
  St_DT          Date,  
  Int            Decimal (10,2) );
```

3. Display the details of all the loans.

**Ans. Select \***

**From loan\_accts;**

4. Display the the Acno, Cust\_name, loan\_amt of all the loans.

**Ans. Select Accno, Custname, loan\_amt**

**From loan\_accts;**

5. Display the details of all the loans with less than 40 installments.

**Ans. Select \***

**From loan\_accts**

**Where instl < 40;**

6. Display the Accno & loan\_amount of all the loans started before 01-04-2009.

**Ans. Select Accno, loan\_amt, st\_dt**

**From loan\_accts**

**Where st\_dt < '01-04-2009';**

7. Display the details of all the loans whose rate of interest is NULL.

**Ans. Select \***

**From loan\_accts**

**Where Int\_rt is NULL;**

8. Display the no. of Installments only once.

**Ans. Select Distinct(Instl)**

**From loan\_accts;**

9. Display the details of all the loans whose loans\_amt range is 400000 to 500000.

**Ans. Select \***

**From loan\_accts**

**Where loan\_amt between 400000 and 500000 ;**

10. Display the accno, cust\_name starting with character A.

**Ans. Select Accno, Cust\_name**

**From loan\_accts**

**Where cust\_name like 'A%';**

11. Display all the records as per ascending order of Installments.

**Ans. Select \***

**From loan\_accts**

**Order by Instl;**

12. Enter the values in Tnerest column by formula  $S = P * R * T / 100$  where T is no. of Installemts divided by 12.

**Ans. Update loan\_Accts**

**Set Int= (loan\_Amt \* Int\_RT \*(Tnstl/12)/100);**

**From loan\_accts;**

### **Grouping of Records (Aggregate or Group Functions)**

When multiple records from a table are to be combined together to perform a calculation, aggregate functions are used. They are used with SELECT clause these are

- **COUNT()** - Count the rows values.
- **SUM()** - Calculate the Sum.
- **AVG()** - Calculate the Average.
- **MAX()** - Find Out the Maximum.
- **MIN()** - Find Out Minimum.

13. Display the rows as per grouping of Installments

Ans:- **Select \***

**From loan\_accts**

**Group by instl;**

14. Display the counting of loan\_Accts as per grouping of Int\_Rt

Ans:- **Select count(\*), Int\_Rt**

**From loan\_accts**

**Group by Int\_Rt;**

15. Display the total amount of loan given to all the customers.

Ans:- **Select sum(loan\_amt**

**From loan\_accts ;**

16. Display the customer name with max loan.

Ans:- **Select Cust\_name, max(loan\_amt)**

**From loan\_accts**

**Group by instl;**

17. Display how many rows are there in the table

Ans:- **Select count(\*)**

**From loan\_accts;**

#### **Integrity Constraints (Table Constraints)**

- These constraints are the rules that are defined when a table is created.
- These rules are checked during Insert Command.
- On violation the record is not stored in the table.

**Constraints Are:-**

1. Primary Key
2. Unique
3. Not Null
4. Foreign Key
5. Default
6. Check

e.g.

**Create Table Student**

( Schno    Int(6)            Primary Key,  
 Name    Varchar2(30)    Not Null,  
 Fees    Int (6)            Default 1000,  
 Age    Int(6)            Check (Age > 5),  
 UID    Int(6)            Unique );

#### **Functions in MySQL**

##### **Numeric Functions:**

S.no	Function	Description & E.g.
1	POWER(x, y)	Returns the value of x raised to the power of y.
2	ROUND(x)	Rounds the argument x to the nearest INTEGER.
3	ROUND(x,d)	Rounds the argument x to d decimal places.

4	TRUNCATE(x, d)	Truncates the argument x to d decimal places.
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#### String Functions:

S.no.	Function	Description & E.g.
1	LENGTH(str)	Returns the length of a column or a string in bytes.
2	CONCAT(str1,str2,...)	Returns the string that results from concatenating the arguments. May have one or more arguments.
3	INSTR(str, substr)	Returns the position of the first occurrence of substring <substr> in the string <str>.
4	LOWER(str) or LCASE(str)	Returns the argument <str> in lowercase
5	UPPER(str) or UCASE(str)	Returns the argument <str> in uppercase.
6	LEFT(str,n)	Returns the first <n> characters from the string <str>
7	RIGHT(str,n)	Returns the last <n> characters from the string <str>
8	LTRIM(str)	Removes leading spaces, i.e., removes spaces from the left side of the string <str>.
9	RTRIM(str)	Removes trailing spaces, i.e., removes spaces from the right side of the string <str>.
10	TRIM(str)	Removes both leading and trailing spaces from the string <str>.
11	MID(str,m,n)	If <m> is negative, the beginning of the substring is the m character from the end of the string.
12	ASCII(str)	Returns the ASCII value of the first character of the string <str>. Returns 0 if <str> is the empty string. Returns NULL if <str> is NULL

#### Date and Time Functions:

S.no.	Function	Description & E.g.
1	CURDATE()	Returns the current date in YYYY-MM-DD format or YYYYMMDD format, depending on whether the function is used in a string or numeric context
2	NOW()	Returns the current date and time in 'YYYY-MM-DD HH:MM:SS' or YYYYMMDDHHMMSS.uuuuuu format, depending on whether the function is used in a string or numeric context.
3	SYSDATE()	Returns the current date and time in 'YYYY-MM-DD HH:MM:SS' or YYYYMMDDHHMMSS.uuuuuu format, depending on whether the function is used in a string or numeric context.
4	DATE(expr)	Extracts the date part of a date or date time expression <expr>.
5	MONTH(date)	Returns the numeric month from the specified date, in the range 0 to 12. It returns 0 for dates such as '0000-00-00' or '2010-00-00' that have a zero month part.
6	YEAR(date)	Returns the year for specified date in the range 0 to 9999. It returns 0 for the "zero" date. Returns values like 1998, 2010, 1996 etc.
7	DAYNAME(date)	It returns the name of the weekday for the specified

		date.
8	DAYOFMONTH(date)	Returns the day of the month in the range 0 to 31.
9	DAYOFWEEK(date)	Returns the day of week in number as 1 for Sunday, 2 for Monday and so on.
10	DAYOFYEAR(date)	Return the day of the year for the given date in numeric format in the range 1 to 366.

**Q6**

## MySQL JOIN Query & Transaction commands

**10  
MM**

**JOIN:** - Join is a query that combines rows from two or more tables.

**Types of Join:-** Equi Join, Non Equi Join, Cross Join.

JOIN Query

Sql> Select <column names>

From table1 , table2

Where table1.col\_same = table2.col\_same AND <condition if any> ;

TABLE: emp

No	Name	Sal	Zone	Age	Grd	Dept
1	Mukul	30000	WEST	28	B	10
2	Kritika	40000	SOUTH	30	A	10
3	Naveen	40000	NORTH	29	A	20

Table: Deptt

Dept	Dname	HOD
10	Sales	1
20	Fin	5
30	Admin	7

Sql> Select No, Name, Age, Dept, HOD

From Emp , Deptt

Where Emp.Dept = Deptt.Dept And HOD = 5;

Select No, Name, Dname

From Emp , Deptt

Where emp . Dept = Deptt.Dept AND Dname in ('Sales','Fin');

Database Transactions:-

Transaction: - It is a logical unit of work, that must succeed or fail in its entirety. It may be on SQL command or many SQL commands but logically they perform single action.

**Transaction Control Commands:-**

- **Commit:** - This command saves all the changes made in the database & tables.  
e.g. commit ;

- **Rollback:** - This command undo all the changes done in the database or table. That is the table goes in that state in which it was before doing any transaction / change.
- **Savepoint:** - In between the transactions savepoints can be defined. If in any case rollback is needed for partial transactions then savepoint are useful command is  
e.g. Rollback to savepoint\_name ;

#### Compare

<p style="text-align: center;"><b>CHAR</b></p> <p>The CHAR datatype stores fixed length string such that string having smaller length are padded with blank spaces in right side.</p>	<p style="text-align: center;"><b>VARCHAR</b></p> <p>VARCHAR supports variable length strings and can store small length strings without padding saving the memory space.</p>
<p style="text-align: center;"><b>WHERE</b></p> <p>It is used to put a condition on individual row of a table e.g. Select * from EMP where salary &gt; 5000;</p>	<p style="text-align: center;"><b>HAVING</b></p> <p>HAVING clause is used to put condition on the GROUP in the group by clause. e.g. Select SUM(salary), desig from emp group by DESIG having Desig = 'Manager';</p>

Q. Write SQL statement to set Autocommit to off.

Ans. Set Autocommit = 0; // OFF

Set Autocommit = 1; // ON

**Q2,4**

**JAVA**

**20  
MM**

#### Components:-

Also known as “widgets” are the basic interface like JLabel, JButton, JTextField etc. These components are placed on a container like JFrame. Two Types of control

- Parent / Container Control (e.g. FORM)
- Child Control (Label, TextField etc.)

Any component of GUI front-end of an application is an object. Each of these object belong to its corresponding class pre-defined in JAVA. Each of these object belong to its corresponding class predefined in Java. Each object has some properties, methods & event associated with it.

**Properties** :- are used to specify appearance e.g. foreground color, background color etc.

**Methods**:- are used to perform some action on the object e.g. getText(), setText() etc.

#### Method are of 02 types Getter & Setters

**Getters**:- are the methods which extract some information from the object & return it to the program e.g. getText().

**Setters** :- are the methods which set some properties of the object so that the object’s appearance changes e.g. setText ().

**RAD:-Rapid Application Development** describes a method of developing s/w through the sue of preprogrammed tools or wizard.

**Event** :- An event refers to the occurrence of an activity e.g. click etc.

**Token:-** The smallest individual unit in a program is known as a token {Keywords, Identifiers, Literals, Punctuators & Operators}

**Keyword:-** is a pre-defined words carrying special meaning e.g. int, float, if , for etc.

**Identifiers:-** are user defined names given to variables, functions, method, class, object etc.

**DataTypes:-** are means to identify the types of data & associated operations of handling it e.g. byte, short, int, long, float, double.

**Variables:-** A variable is a named memory location, which holds a data value of a particular data types.

**Type conversion:-** The process of converting one data type into another data type two types

- i. Implicit
- ii. Explicit

#### Methods & properties of JLabel & TextField

Properties	Method
Background Editable Enabled Foreground Text	getText(); isEditable(); isEnabled(); setEnabled(true / false); setEditable(true / false); setText(" "); setVisible(true / false);

#### Methods & properties of JTextArea

Properties	Method
Background Editable Enabled Foreground Linewrap rows	append(); getText(); isEditable(); isEnabled(); setEnabled(true / false); setEditable(true / false); setText(" "); setVisible(true / false);

#### Methods & properties of JPassword

Properties	Method
Background text echochar	getPassword(); getText();

#### Methods & properties of JRadioButton & JCheckBox()

Properties	Method
Background buttonGroup() enabled() label()	getText(); setText(); isSelected(); setSelected();



text() selected()	
----------------------	--

### Methods & properties of JComboBox() & JList();

Properties	Method
Background	jcombo
buttonGroup()	getSelectedItem();
enabled()	getSelectedIndex ();
label()	setModel();
model()	jList
selectedIndex()	setSelectedValue();
SelectedItem()	isSelectedIndex();

### JOptionPane

Import javax.swing.JOptionPane;

JOptionPane.showMessageDialog (this , "Message Displayed");

A = JOptionPane.showInputDialog(this , "Enter the value");

Flow of Control in a program can be in three ways:-

- Sequentially
- Selectively (Selection)
- Iteration (looping)

Selection Statements (if & switch)

Types of if

1. If
2. If else
3. If else if else
4. Nested if

<pre> if (ch == 'a')     Grade = "A"; else if (ch == 'b')     Grade = "B"; else if (ch == 'c')     Grade = "C"; else     Grade = "NA"; </pre>	<pre> switch(ch) {     case 'a':         Grade = "A";         break;     case 'b':         Grade = "B";         break;     case 'c':         Grade = "C";         break;     default :         Grade = "NA"; } </pre>
---	---

```

for(int i = 2 ; i<=5 ; i++)
{
    JTextArea1.setText(Integer.toString(i*i));
}

```

```

}

while

int i = 2;
while(i<=5)
{
    JTextArea1.setText(Integer.toString(i*i);
    i++;
}

Dowhile.

```

```

int i = 2;
do
{
    JTextArea1.setText(Integer.toString(i*i);
    i++;
} while(i<=5);

```

### **OOP- Object Oriented Programming**

It emphasis on objects and the interaction between objects. An object is self-contain identity that describes not only certain data but the procedures to manipulate that data.

Components of Object Oriented Programming

- Class
- Object
- Data Members & Methods.
- Access specifier & visibility modes.

**Class** – A class is a specification of the data & functions to be encapsulated with data.

**Object** – in the real world can be represented by objects in the program. Each object contains data & code to manipulate data.

**Inheritance**-It is the capability of one class to inherit properties from an existing class. Inheritance supports reusability of class. Inheritance supports reusability of code & is able to simulate the transitive nature of real life objects.

### **Inheritance helps in 2 ways**

1. Code Reusability
2. Classes relationship

**Method Overriding** - A new method of child class overshadow the old method of parent class is called Method Overriding.

**Method Overloading** – Two methods with same name but with different arguments is called Method Overloading.

**Abstract Class**: - The class that is used only as parent class or base class is called an Abstract Class.

**Interface**: - An interface defines a set of protocol. It declares a set of abstract methods i.e. methods with an empty body.

Database Connectivity of JAVA with MySQL

2 Components are essential to establish the database connectivity.

- JDBC API – S/W used to provide RDBMS access and execute SQL statements within JAVA Code.
- JDBC Driver for MySQL: - S/W component enabling a java application to interact with a MySQL database.

Q. Define method prototype.

Ans. The header statement of method including return type, method name & argument list is called method prototype. `int sumofdig (int n);`

Q. Write a method in java that takes a no. return the sum of digits.

Ans. `int sumofdig (int n)`

```
{
    int sum = 0;
    while (n>0)
    {
        int r= n% 10;
        n=(n-r)/10;
        sum += r;
    }
    return (sum);
}
```

Q. Distinguish Between

Ans:-

<b>Text Field</b>	<b>Password Field</b>
<ol style="list-style-type: none"> <li>1. It shows simple text.</li> <li>2. Reads the content using method <code>getText()</code>.</li> </ol>	<ol style="list-style-type: none"> <li>1. It shows encrypted text.</li> <li>2. Reads the content using method <code>getPassword()</code>.</li> </ol>

Q. Distinguish Between Entry Control Loop & Exit Control Loop

Ans.

<b>Entry Control</b>	<b>Exit Control</b>
<ol style="list-style-type: none"> <li>1. It first check or evaluates the terminating condition &amp; then executes the loop body.</li> <li>2. In case the condition is false for first time then loop will not get executed.</li> </ol>	<ol style="list-style-type: none"> <li>1. It first evaluates the loop body &amp; then checks the terminating condition. If the condition is found true the loop continues otherwise the loop stops.</li> <li>2. In case if the condition is false in first time then the loop will still get execute at least once.</li> </ol>

Q. Distinguish between if – else if & switch case

Ans:-

<b>If else if</b>	<b>Switch case</b>
<ol style="list-style-type: none"> <li>1. If – else if combination allows any kind of condition after each. If i.e. <code>&lt;</code>, <code>&lt;=</code>, <code>&gt;</code>, <code>&gt;=</code>, <code>==</code> &amp; <code>!=</code></li> </ol>	<ol style="list-style-type: none"> <li>1. Switch case allows only constant matching values for condition i.e. <code>==</code> only</li> </ol>

Common Syntax errors. (underlined>

<b>Incorrect</b>	<b>Correct</b>
<ol style="list-style-type: none"> <li>1. <code>int i=2 ; j=2 ;</code></li> <li>2. <code>if i &lt;= 5;</code></li> <li>3. <code>for(i=0 , i&lt;5, i++)</code></li> <li>4. <code>i+5 = j;</code></li> <li>5. <code>textField1.setText("");</code></li> </ol> <p style="text-align: center;"><b>Incorrect</b></p> <ol style="list-style-type: none"> <li>6. <code>{             y = i++;         } while (y&gt;1)</code></li> </ol>	<ol style="list-style-type: none"> <li>1. <code>int i= 2, j= 2;</code></li> <li>2. <code>if (i&lt;=5)</code></li> <li>3. <code>for(i=0;i&lt;5;i++)</code></li> <li>4. <code>i= j + 5;</code></li> <li>5. <code>textField1.setText();</code></li> </ol> <p style="text-align: center;"><b>Correct</b></p> <ol style="list-style-type: none"> <li>6. <code>do{             y=i++;         } while(y&gt;1);</code></li> </ol>

<pre> 7.  int i;     for(i=0 ; i&lt;5; i++) 8.  if p=2     jTextField("Two"); 9.  l=integer.parseint(jTextField.getText()     ). </pre>	<pre> 7.  int i;     for(i=0 ; i&lt;5; i++) 8.  if (p==2)     jTextField.setText ("Two"); 9.  l=Integer.parseInt(jTextField.getText()     ). </pre>
---	---

**Q1.** A Quick Fox Transport Co. wants to develop an application for calculating amount based on distance and weight of goods. The charges (Amount) to be calculated as per rates given below.

Distance	Weight	Charges per Km.
>=500 Km	>=100 kg.	Rs. 5/-
	>=10 and <100 kg.	Rs. 6/-
	< 10 kg.	Rs. 7/-
<500 Km	>=100 Kg.	Rs.8/-
	<100 Kg.	Rs.5/-

The screenshot shows a Java Swing window titled "Quick Fox Transport Co." with a light gray background. It contains five text input fields arranged vertically: "From (City)" with "Delhi", "To (City)" with "Mumbai", "Weight (Kg)" with "800", "Distance (Km)" with "1200", and "Amount" with "6000.0". To the right of the "Distance (Km)" field is a "Calculate" button, and to the right of the "Amount" field is an "Exit" button. The window has standard Windows-style title bar controls (minimize, maximize, close).

```

Ans:- int wt = Integer.parseInt (jTextField3.getText());
int dt = Integer.parseInt (jTextField4.getText());
int tamt, cgs=0;
if(dt>=500){
    if (wt>=100)
        cgs = 5;
    else if (wt>=10)
        cgs = 6;
    else
        cgs = 7;
}
else{
    if (wt>=100)
        cgs = 8;
    else
        cgs = 5
}
tamt = wt * cgs ;
jTextField.setText(" " + tamt );
System.exit(0);

```

**Q2.** Develop a Billing application for Happy Shopping- A retail chain involved in sales of Readymade garments. The happy Shopping offers discount to its members holding Platinum, Gold and Silver card.

The 10% discount is given to Platinum card, 8% to Gold Card and 5% to Silver Card holders on sales amount.

```
int rt = Integer.parseInt(jTextField2.getText());
int qty = Integer.parseInt(jTextField.getText());
int tmt = rt * qty;
jTextField4.setText(" " + tmt);
int disc=0;
if(jRadioButton1.isSelected())
    disc = 10;
else if(jRadioButton2.isSelected())
    disc = 8;
else if(jRadioButton3.isSelected())
    disc = 5;
int dis = tmt * disc / 100;
int namt = tmt - dis;
jTextField4.setText(" " + dis);
jTextField5.setText(" " + namt);

System.exit(0);
```

Q3. The Entertainment Paradise- A theater in Delhi wants to develop a computerized Booking System. The proposed Interface is given below. The theater offers different types of seats. The Ticket rates are- Stalls- Rs. 625/-, Circle- Rs.750/-, Upper Class- Rs.850/- and Box- Rs.1000/-. A discount is given 10% of total amount if tickets are purchased on Cash. In case of credit card holders 5% discount is given.

```
int tkrt;
if(jRadioButton1.isSelected())
    tkrt = 625;
else if (jRadioButton2.isSelected())
    tkrt = 750;
```

```

else if (jRadioButton3.isSelected())
    tkrt = 850;
else
    tkrt = 1000;
int tst = Integer.parseInt(jTextField1.getText());
int tamt = tst * tkrt ;
int disc = 0;
if(jRadioButton4.isSelected())
    disc = 10;
else
    disc = 5;
int ntdisc = tamt * disc / 100;
int ntamt = tamt - ntdisc;
jTextField2.setText(""+tamt);
jTextField3.setText(""+ntdisc);
jTextField4.setText(""+ntamt);

```

Q4. ABC Consultancy is a placement organization, assists job seekers. The Entry form has to be designed to facilitate the Registration Process with following features.

1. When Submit button is pressed, the following things should happen.

If Post Graduate is checked, the 10+2 and Graduate checkboxes should also get selected automatically.

If Graduate is checked, the 10+2 checkboxes should also get selected.

A Message Box with "Hello Mr. .... you are registered" or "Hello Miss... .... you are registered" as per Gender of candidate.

2. When Clear Button is pressed, all the text boxes, check boxes gets cleared, and Male and Science option is selected by default.

```

Ans. if(jCheckBox3.isSelected())
{
    jCheckBox1.setSelected(true);
    jCheckBox2.setSelected(true);
}
if(jCheckBox2.isSelected())
{
    jCheckBox1.setSelected(true);
}
if(jRadioButton1.isSelected())
    JOptionPane.showMessageDialog(this,"Hello Mr."+jTextField1.getText()+"you are registered ");
else
    JOptionPane.showMessageDialog(this,"Hello Mrs."+jTextField1.getText()+"you are registered ");

```

**HTML – Hyper Text Markup Language**

- Hypertext is the method by which we move around on the web by hyperlink.
- Markup is what HTML tags do to the text inside them.
- It is a language as it has code words & syntax like any other language.

**Container Tag** A tag which has start tag & end tag is called container tag.

e.g. <I> .....</I>

<h1> ..... </h1>

**Empty Tag:-** A tag which has only start tag is called empty tag. E.g. <Br> <Hr>

**Comment line is HTML.**

e.g. <!-- This is a comment line.-->

Anchor Tag is used to create hypelinks

<a href = "www.cbse.nic.in"> CBSE </a>  
Name of website linkname

Common graphics file formats are .gif & .jpg file formats.

Tag used to insert an image n webpage <img src = "abc.jpg">

**Q. HTML code to make an image as background image.**

Ans:- <body background = "pen.jpg">

Q. Find error in <OL > Type = "a" start ="d">

< OL Type = "a" start ="d">

Q. Distinguish b/w XML & HTML

XML	HTML
<ul style="list-style-type: none"> <li>• Defines, stores &amp; retrieves the data.</li> <li>• XML tags are not predefined.</li> <li>• New tags can be created.</li> <li>• XML tags must have closing tags.</li> <li>• XML tags are case sensitive</li> </ul>	<ul style="list-style-type: none"> <li>• Define how webpage is displayed.</li> <li>• HTML tags are predefined.</li> <li>• No new tags are defined.</li> <li>• Not Necessary</li> <li>• Not case sensitive.</li> </ul>

Q. Distinguish Between OL Tag & UL Tag

Ans.

OL Tag	UL Tag
<ul style="list-style-type: none"> <li>• Ordered list can be displayed.</li> <li>• Numeric values or roman values are displayed before the name.</li> </ul> <p>E.g. 1. Apple 2. Orange</p>	<ul style="list-style-type: none"> <li>• Unordered List can be displayed.</li> <li>• Bullet is displayed before the name.</li> </ul> <p>E.g.</p> <ul style="list-style-type: none"> <li>• Apple</li> <li>• Orange</li> </ul>

<TABLE> tag is used for displaying a table.

<Table> .....

</Table>

- <TR> tag is used to add rows in the table. <TR> ..... </TR>

\*\*\*\*\*