NCFT Assessment

BE Software (202± Spring)

Fundamentals of IT

1) a) How JIT and TQM can help organizations to alleviate pressures.

⇒ JIT and TQM help organizations to alleviate pressures as they help to overcome the business problems with the following roles:-

1) JIT reduces manufacturing costs.
2) JIT reduces costs and improve workflow by scheduling materials and parts to arrive at a workstation exactly when they are needed.
3) JIT reduces inventory cost of in-process inventories and waste that reduces costs and spaces.

4) TQM helps to improve quality wherever and whenever possible.

5) TQM enhances quality of a product by monitoring data, collecting, analysing and reporting data.
6) TQM increases the speed of inspection, raise the quality of testing and reduce costs of various quality control activities.

Satya Raj Awasthi (211783)

b) What are the capabilities of CBIS?

→ Inorder to compete successfully in modern business environment. Information systems must be able to do following:

a) provide fast and accurate transcation processing:

→ Each transations generates data. These data must be captured, recorded, stored and updated accurately. Also, the process should be quick that shows benefit of using CBIS over workforces.

b) provide large capacity, fast storage:

→ CBIS's must provide both enormous storage for ~~both~~ corporate data, and also fast access to those data.

c) provide fast communication:-

→ Networks enable organizational employees and computers to communicate almost instantly over the world. So, Information systems should be able to provide fast communication through use of networks or other technologies

d) Reduce information overload:-

→ As Internet doubles information every 1no

days. CBISs should be capable of overcoming this issue using executive information systems like a software that prioritizes managers emails etc. accord to criteria that are set.

e) Span boundaries:-

→ As CBIs are preffered to span boundaries. So, they must be able to increase customer satisfaction by providing a supply-chain, product delivery around the globe.

f) Provide support for decision:

→ Using executive information system "that reduces information overload & increase customer orientation" and decision support system. Information systems should be capable of decision making as rules.

(6) With suitable examples explain Data, Information and knowledge.

=> Data:

- Raw facts or elementary description of things, events, activities and transactions that are recorded, classified, and stored. But are not organiced to convey

any specific meaning.
Eg: Bank balances, grade point average etc.

Information:
→ Data that have been organized to that they have meaning and value to the recepeint i.e. processed data.
Eg: Customer names with bank balance, student name with their grade etc

- Knowledge:
→ Data or information that have been organized and processed to convey understanding, experience, accumulated learning, and expertise as apply to a current problem or activity.
Eg: Names of customers which bank balance is more than 10 lakhs are to be invited to contact bank.

2. a) Compare and contrast OSI- Reference model and TCP/IP protocol.
+ Following are the similarities between OSI reference model and TCP/IP refe-

-rence model:
→ Both have layered architecture.
→ Layers provide similar functionalities.
→ Both are protocol stack.
→ Both are reference models.

Following are some major differences betn OSI reference model & TCP/IP reference model; with diagrammatic comparision below:

	OSI (Open System Interconnection)	TCP/IP reference (Transmission control Protocol / Internet protocol)
1.	OSI is a generic, protocol independent standard., acting as a communication gateway between the network and end user	→ TCP/IP is based on standard protocols on which the internet has developed. It is a communication protocol, which allows connection of hosts over internet.
2	Here transport layer guarantees the delivery of packets	2 Here, transport layer doesn't guarantee delivery of packets.
3.	It is considered less reliable.	3. Considered more reliable
4.	It is used as guidance tool.	4. It is a way implementation of OSI.

5.	OSI model has a problem of fitting the protocol into the model.	5. Does not fit any protocol.
6.	It is protocol independent.	6. It is protocol dependent.
7.	Here are 7 layers.	7. It has 4 layers.

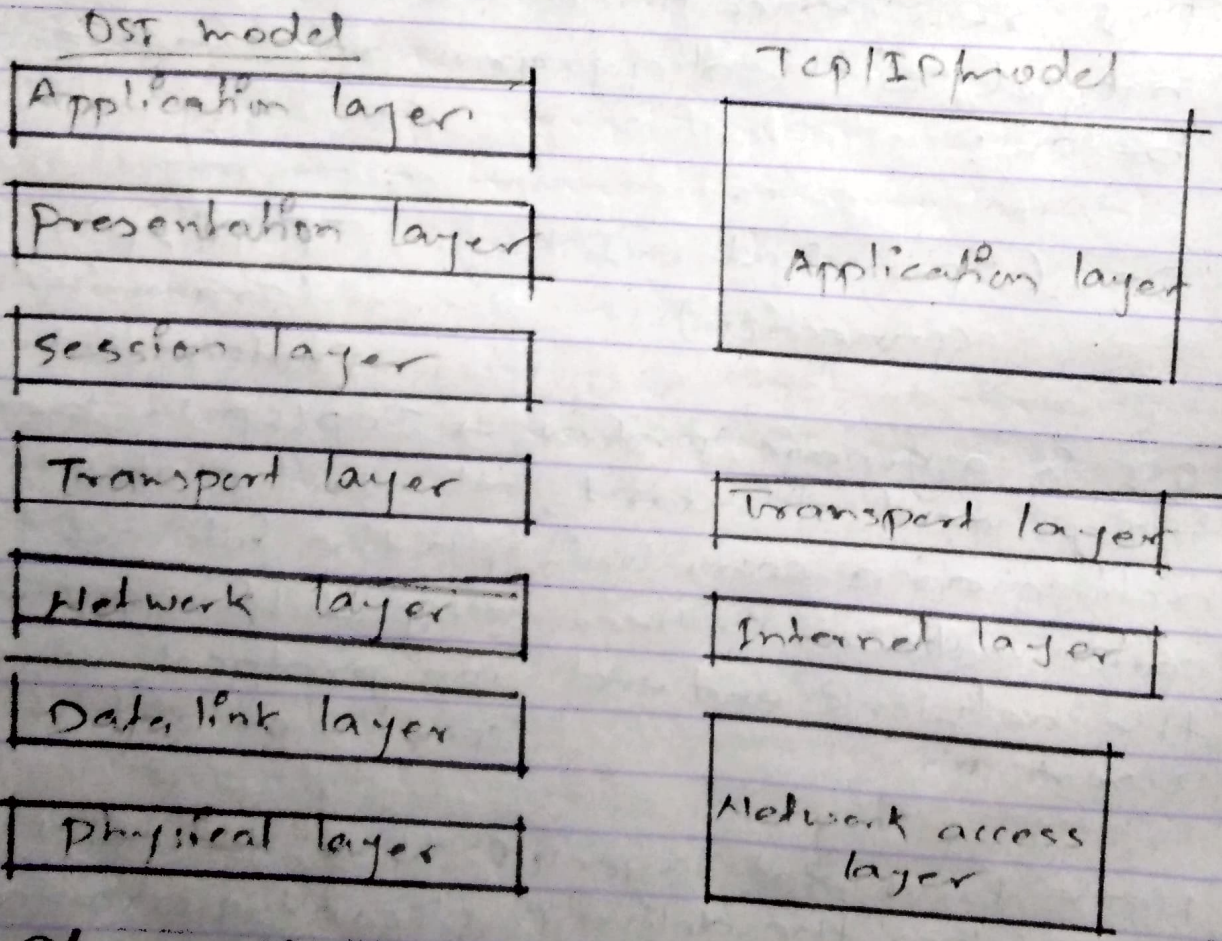


Fig: Diagrammatic difference of OSI & TCP/IP model.

3. a) Explain database with its features. Also list out different database models.

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

→ DBMS is used to access, manage, ~~and~~ update data on database. Database Management system (DBMS) is a software that serves as an interface betn the end user and a database, allowing users to create, read, update and delete data in database.

→ Eg. of database are Student's database, users database etc.

→ While examples of DBMS are Oracle, MySQL, MongoDB etc.

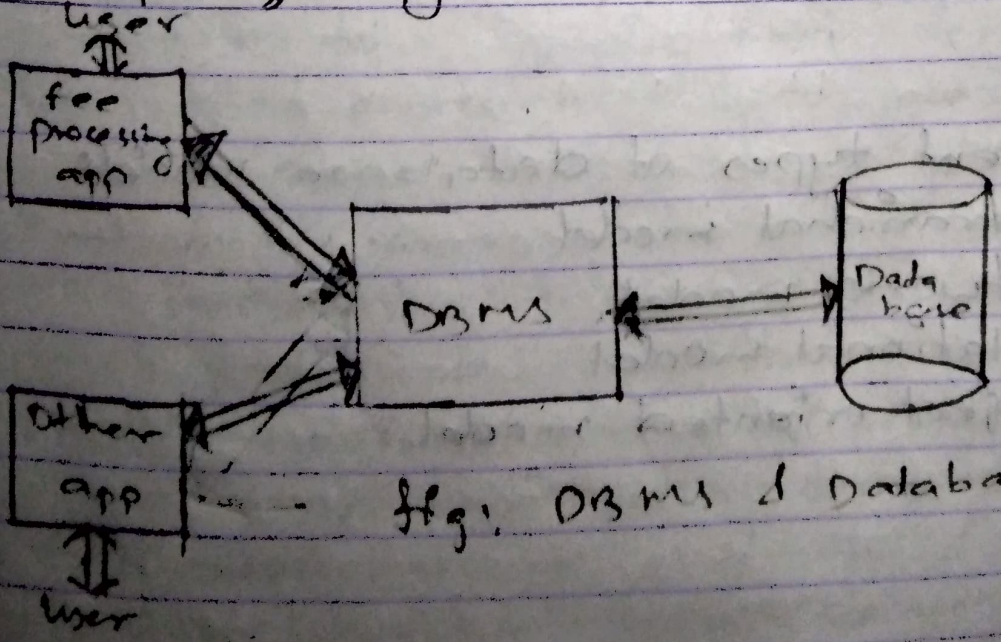


fig: DBMS & Database

* Features of Database:

a) Able to store all kinds of data that exists in this real world.

b) Able to relate entities / tables in the database by means of relation.

c) Data and application are isolated as data and database are different from each

d) No data redundancy: There is no duplication in data.

e) Has a strong query language which helps the user to retrieve & manipulate data once the database is designed.

f) provides shared access.

g) It provides security, each user have own level of access over own data only.

h) Supports ACID property while performing transactions.

=> Different types of database models.

A) Hierarchal model

B) Network model

c) Relational model

d) Object oriented model.

b) Explain Enterprise Storage System.

→ It is an independent, external system with intelligence that includes 2 or more storage devices.

→ Enterprise Storage systems provide large amounts of storage, high-performanced-atn transfer, a high degree of aviability protection against data loss and better management tools.

There are 3 major types of ESS They are:

i) Redundant array of independent disks (RAID): It provides a way to store the same data in different disks
   → RAID links groups of standard hard drives to a specialized microcontoller that coordinates to appear them as a single logical drive.
   → As it stores data redundantly, loss of data due failure of single drive is protected.

ii) Storage Area Network (SAN):-

→ SAN is an architecture for building special, dedicated networks that allows rapid and reliable access to storage devices by multiple servers.

→ A SAN moves storage resources off the common user network and reorganizes them into an independent, high performance network.

iii) Network attached storage (NAS):-

→ NAS is a special purpose server device that provides file storage to users who access the device over a network.

→ It is simple to install i.e. plug and play, and works exactly like a general purpose file server.

Q.N.4 a) Write a short description about HTML, CSS and XML.

⇒ HTML:

i) Stands for Hypertext Markup language.

ii) Standard language that worldwide web uses for creating and recognizing hypertext documents.

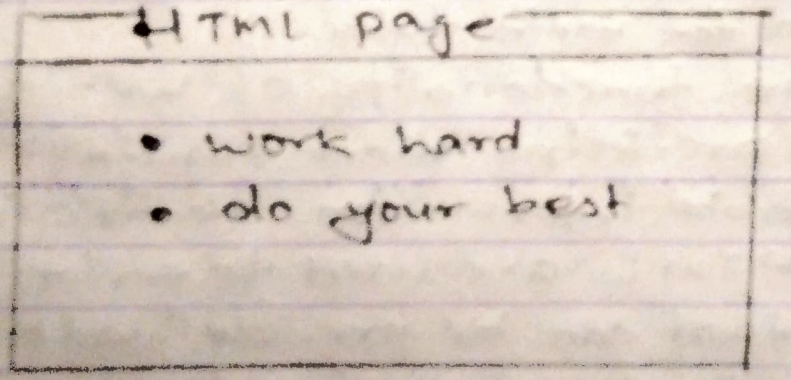
iii) It is skeleton of web page that gives users the option of controlling visual elements such as font, font size & paragraph spacing without changing any information.

iv) Everything is written in tags. that are already defined

For eg:

```
<html>
<head>
<title> HTML page </title>
</head>
<body>
<ul>
<li> work hard </li>
<li> do your best </li>
</ul>
</body>
</html>
```

This will produce following output on the web page:



* CSS:

i) Standard for cascading style sheets.
ii) Used to add visual enhancements and designs on web pages.
iii) Are written inside HTML file with own set of rules or written in another file individually and linked together HTML file.

Eg:

```
<style>
 li {
 background-color : red ;
 }
</style>
```

→ This will add background color of red on the text written inside <li> tags.

* XML:

→ Stands for Extensible Markup language

→ Mostly used to perform tasks that cannot be done by HTML like adding configurations and for meta data.

→ They improve functionality of web documents by providing more flexible and adaptable information identification

→ Tags like HTML are used to perform operations that can be pre-defined or customly defined as per need & use.

Eg:

```
<DEPARTMENT = "software">
<COURSE TITLE> FSI </COURSE TITLE>
<INSTRUCTOR="Nishanian Thapa" />
```

b) What are two types of system software?

⇒ System software is a class of programs that is designed to provide a platform for other softwares to run a computer hardware and application program.

→ It controls ~~the~~ & support the computer system and information processing systems.

• It can be grouped into two major functional categories that are:

© System control programs:-

→ It controls the use of hardware, software, and data resources of computer system.

→ Operating system is the main system control program that supervises all the operation including input, output, controlling use of memory etc

Its common tasks are:

→ monitoring performance
→ correcting errors
→ providing and managing user interface
→ Process management
→ Booting the computer system
→ Creating, maintaing & locating files & directories
→ Reading programs into memory.
→ managing memory and controlling I/O.

→ Some examples of Os are Linux, Mac Os, Windows, Java Os (JVM) etc

ii) System support programs:

→ It is second major category of system software. Which supports the operations, management and users of computer system by providing a variety of support services.

→ Examples of system support program are system utilities, performance monitors & security monitors.

a) System utilities perform tasks like sorting records, creating directories, store accidentally erased files, check integrity of of diskettes etc.

b) System performance monitors performs tasks like monitoring processes and produce reports and solve system case problems.

c) System security monitors protect computer from unauthorized access and called Walls of attempts at improper use.

c. Explain how an e-mail is sent and received ?.

→ E-mail working follows the client-server approach. In this client is the mailer i.e the mail application or mail program and server is a device that manages-email.

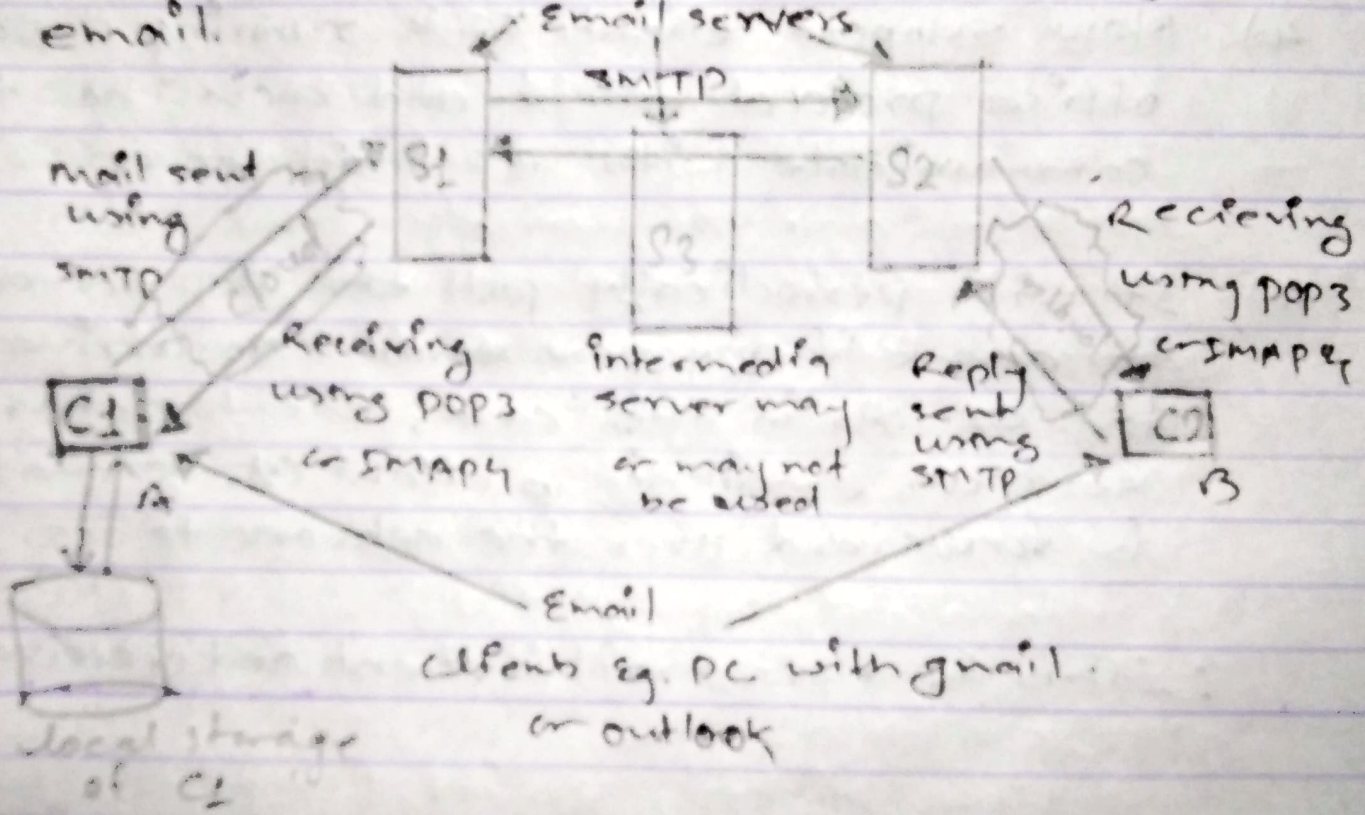


fig:- Sending and receiving e-mail using desktop email clients.

→ The above approach is followed like as

1) Suppose person A i.e client C1 wants to send an email to person B i.e client C2.

2) Person A (client C1) composes the messages using a mailer program i.e mail client and then select

send option.

3) The message is routed to Simple Mail Transfer Protocol to client C2's mail server.

4) Now suppose client C2 is running a post office protocol client and knows how to communicate with B's mail server.

5) It will periodically poll the pop server to check if any new email has arrived for C2. As in this case, client C2 has sent an email for client C2, so email is forwarded over the network to C2.

∴ This is how mail is sent and received.

5 a) What is MIS?

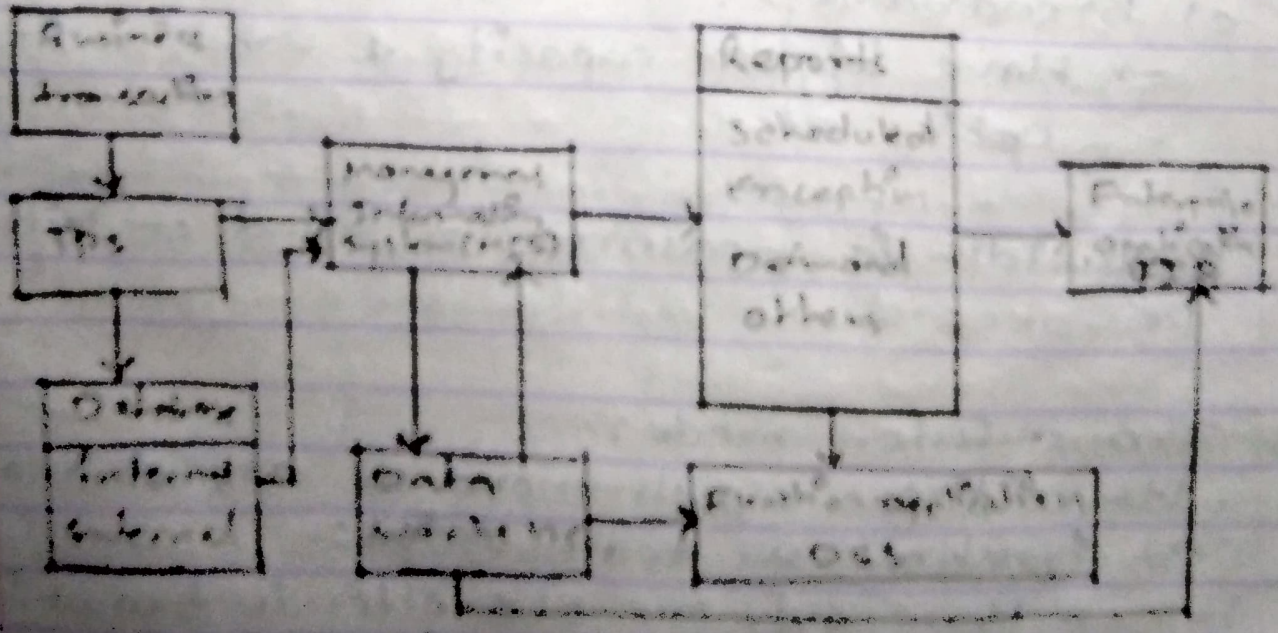
→ A management information system (MIS) is a computerized database of financial information organized and programmed in such a way that it produces regular reports on operations for every level of management in a company.

An MIS produces following reports.

1) Routine / scheduled reports:
These reports are produced at scheduled intervals, ranging from hourly quality control reports to reports on monthly absenteeism rates.

2) Ad-Hoc (Demand) reports :-
→ Some reports are frequently needed that can't be given by routine reports so demand report is there.
→ They also include drill down reports.

3) Exception reports:
→ These kind of reports include only information that exceeds certain threshold standards.



b. What are the characteristics of transmission channels?

=> Transmission channels have several characteristics that determine their efficiency and capabilities.

↳ Most common characteristics are:

i) Transmission speed / Bandwidth:

→ It refers to the range of frequencies available in any communication channel.

→ The greater the bandwidth the greater transmission capacity of channel.

→ It is sub categorized into three parts;

a) narrowband channels:
   → slow and low capacity channels

b) voiceband channels:
   → medium capacity used by telephones

c) Broadband:
   → Have highest capacity & used in fibre optics etc.

→ Bandwidth is measured in baud or bits per second.

ii) Transmission mode:
→ It is either synchronous or asynchronous

a) Synchronous transmission:
   → Here only one character is transmitted

or received at a time.
→ Receiving unit should know start and end bit.

b) Asynchronous transmission:-
→ A group of character is sent over a communication link in a continious bit stream.
→ Sender and receiver should be in perfect synchronization for good accuracy.

(iii) Transmission accuracy:
→ Here error checksum and correction is done to make transmission accurate.
→ Error correction is done by Backward error correction and forward error correction methodology.

6 a) What is search engine and how does it work?
→ Search engines are programs that return a list of web sites or pages with URL that match selected criteria.
→ It looks for the results in its own database, sorts them and make an ordered list of these result using unique search algorithms. The list is called search engine

results page.
Common eg: of search engines are google, bing, yahoo etc.

The fundamental working principle of search engine is based on:
1) Crawling
2) Indexing
3) Ranking

a) Crawling/web crawlers
→ Discovery of ~~search~~ new pages on the web starts with this process
→ Search engine uses small programs called web crawlers (also called bots or spider bots) that traverse the web automatically.
→ Collecting ~~data~~ index data on one of two search principles: depth first (links that are deemed relevant to a topic) or breadth first (collects entire network of links from a given starting point regardless of the page points)

b) Registration:
→ It is followed by most search sites where developers register their site of pages by

submitting a registration form.

→ There is another way Metasearch engines that automatically enter search queries into a number of other search engines and return the results page.

b) What are the characteristics of Data-warehouse?

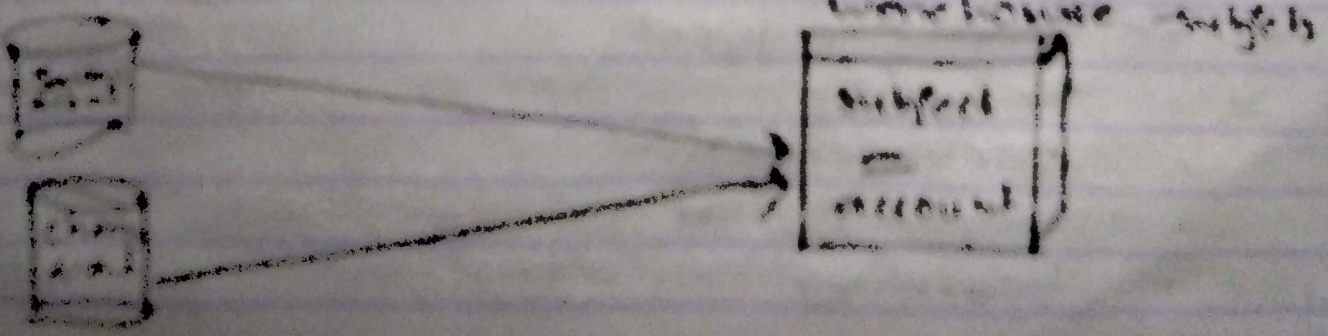
→ The key features of Data Warehouse are:

i) Data-Warehouse is subject oriented

→ As warehouse target on the modelling & analysis of data for decision makers. It provide a concise and straightforward view around a particular subject it excludes data that are not related to subject

ii) Data-Warehouse is integrated

→ It integrates various heterogeneous data sources like RDBMS, flat files and online transaction records.



(iii) Data Warehouse is time variant :-

→ Historical information is kept in a data warehouse

→ It relates more with current file so it is time variant.

(iv) Data Warehouse is Non-volatile

→ In Data Warehouse once a data is entered it should not be changed as it is only read to make decision Also as purpose of it is to enable us to analyse what has occured

c. How do you evaluate a software ?

→ Quality of a software can be evaluated considering the following points:

- Ease of use in development
- maintenance
- Data handling
- Graphic presentation
- Enhancements and hardware
- Vendor support
- Security
- Documentation
- Output option
- Learning

→ - customizable as per needs.

↳ Studying needs and criteria of the domain a software can be evaluated considering above points with needs and criteria.

3. Write short notes on ANY TWO

a) ER Diagram:-

→ Entity Relationship (ER) diagram shows the relationship between entity sets. An entity set is a group of similar entities and these entities can have attributes. In terms of DBMS, an entity is a table or attribute of a table in database. So by showing relationship among tables and their attributes, ER diagram shows the complete logical structure of database. Geometric shapes are used to represent entity, attributes, relationship etc and each character have specific symbol. Which looks like:

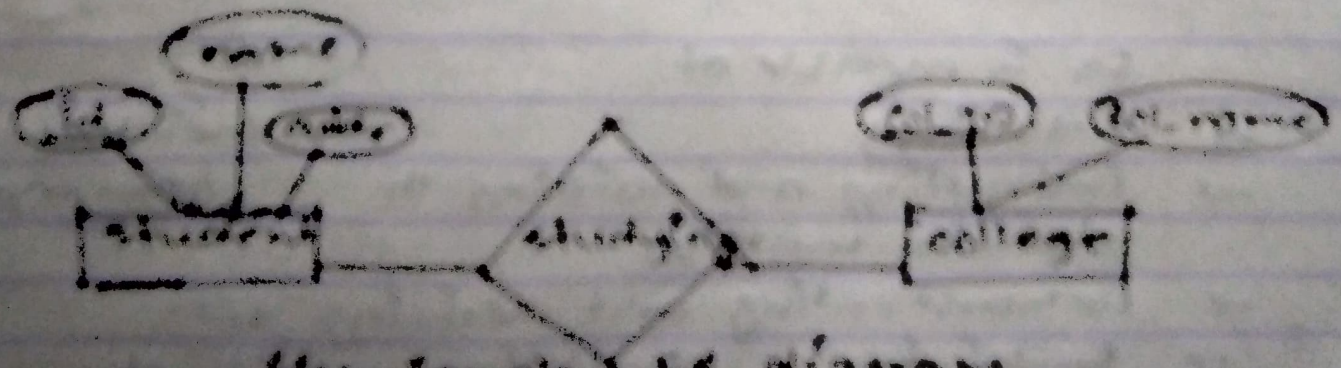


Fig: Sample ER diagram

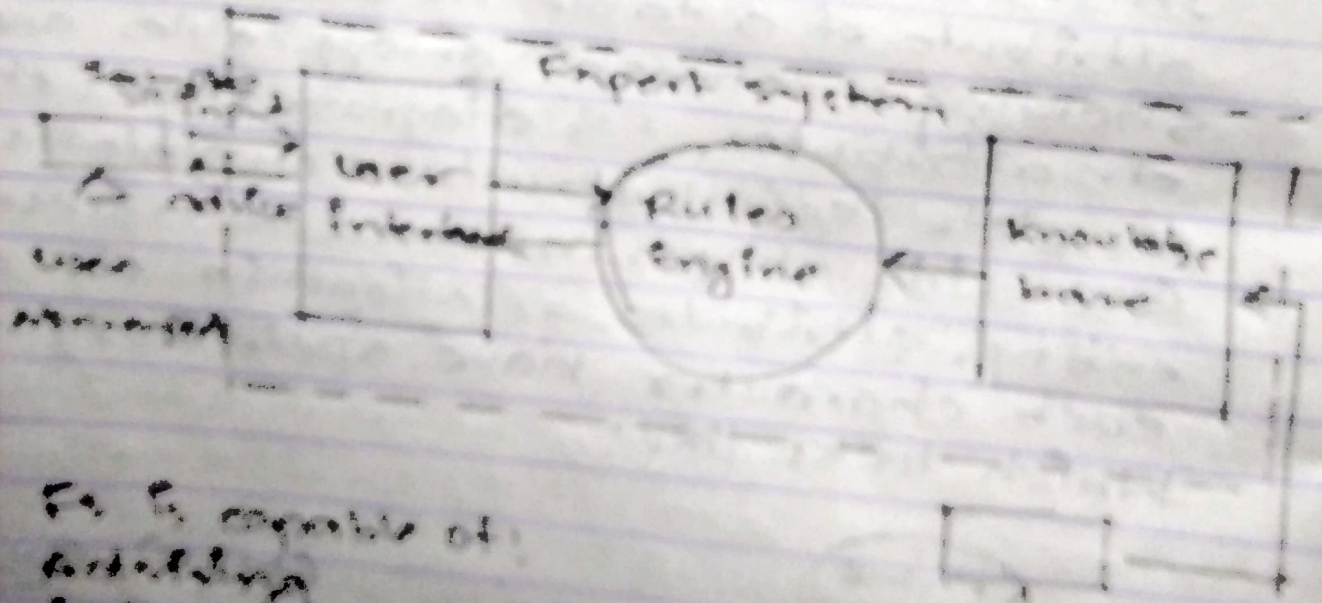
b) Expert System (ES):

→ It is a computer program i.e. designed to solve complex problems and provide decision making ability like human expert.

→ These systems are designed for a specific domain like science, medicine etc.

→ Its performance is based on experts knowledge stored in its knowledge base.

Eg of ES - suggestion of spelling error in google search.



ES is capable of:

→ Modelling
→ Reasoning and making decision & advice
→ Communicating and deciding with
→ Explaining & predicting results etc.