CHETTINAD COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY
CLIENT SERVER COMPUTING
2 MARKS AND 16 MARKS QUESTION BANK
V- SEMESTER
UNIT-I
PART-A

1. What is client/server computing?
The client/server computing is that server software accepts requests for data from client software and
returns the results to the client.

2. Where the applications processing is done/performed?
   - Application processing performed on more than one m/c in a network may be either distributed computing
     or co-operative processing.
   - Distributed computing partitions the data between two or more computer, which may be geographically
     dispersed.
   - Co-operative processing splits an application’s function (processing) between two or more computers in a
     peer to peer relationship.

3. What is the client?
The client is a process (program) that sends a message to a server process, requesting that the server
perform a task (services).

4. What is the server?
A server process fulfills the client request by performing the task required. server programs receive
requests from client programs execute database retrieval and updates and dispatch responses to client requests.

5. What are the application tasks available in client server computing?
   - User interface
   - Presentation logic
   - Application logic
   - Data request and result acceptance
   - Data integrity
   - Physical Data Management

6. Explain the variation in Rightsizing
Three variations are:
   - Downsizing
   - Upsizing
   - Smart sizing

   DOWNSIZING:
   When it is re-engineered to run in a smaller/LAN based environment.

   UPSIZING:
   Run in the larger environment.

   SMART SIZING:
   It affects the entire organizational structure & involves re-engineering, redesigning
   the business process.

7. Give the benefits of CSC:
   - Dollar saving
   - Increased Productivity
   - Flexibility & Scalability
   - Resource utilization
   - Centralized Control
   - Open Systems
8. What is the use of open system?

- Userfriendly.
- Software can easy to download..
- Any one can access.
- Secure.

9. Describe the evolution of CSC?

- Hardware trends
- Software trends

**HARDWARE TRENDS:**
- Power
- Chips
- Memory

**SOFTWARE TRENDS:**
- Relational database
- GUIs
- Multithreaded processing.
- Continuing evolution.

10. Define GUIs.

GUIs platforms do more than provide a presentation layer to the application layer. They provide an operating environment on top of the operating system of the desktop machine. A GUI presents its user with information in windows, which are rectangular areas on a screen.

11. What is the multithreaded?

Multithreaded is the more than one thread will be processed/accessed. A thread is a Process or an execution. It supports multiple threads of execution and allows the thread to communicate with each other.

12. Write down the components of CSC?

There are three components:

- Client
- Server
- Network

13. List the classes of CSC?

Three classes:

- Host-Based Processing
- Co-operative Processing
- Client-Based Processing

14. Difference between CSC and mainframe environments:

<table>
<thead>
<tr>
<th>MAINFRAME</th>
<th>CSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costly to maintain</td>
<td>Easier to maintain</td>
</tr>
<tr>
<td>H/W S/W &amp; staff required to maintain &amp; develop application are very expensive</td>
<td>Inexpensive to maintain &amp; develop application.</td>
</tr>
<tr>
<td>Maintenance cost of a server is higher</td>
<td>Maintenance cost of a server is negligible</td>
</tr>
<tr>
<td>Main-frame base application can be developed in more-time</td>
<td>Client-based application can be developed in less time</td>
</tr>
</tbody>
</table>

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15. Why client-based processing applications do some cooperative processing?

Client-based processing applications do some cooperative processing. Because data validation, stored procedure, triggers executed on the server.

16. What is Presentation logic?

Presentation logic is that, what happens when the user interacts with the form on the screen.

17. List out the categories of client server application.

- Office system.
- Frond-ends to existing system.
- Database access.
- Transaction processing applications.
- Investigative applications.

18. What are the two LAN Mail products?

- MS Mail 3.0
- Lotus’s cc:Mail

MS uses its own system-level messaging application programming interface (MAPI).
Lotus support vendor independent messaging (VIM), application programming interface (API).

19. Define flexibility.

As new client join the system, the old clients and server remain unaffected. An application does not have to be redesigning to use new interface software or be moved to a new platform.

20. Difference between peer-to-peer and CS computing

<table>
<thead>
<tr>
<th>CLIENT SERVER COMPUTING</th>
<th>PEER-TO-PEER COMPUTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Client initiates communications.</td>
<td>1. Any participant can communication.</td>
</tr>
<tr>
<td>2. Client issues request to a server.</td>
<td>2. Any devices can generate a request.</td>
</tr>
<tr>
<td>3. Server replies/perform some service.</td>
<td>3. Any devices may provide a response.</td>
</tr>
</tbody>
</table>

21. What is the client-based processing?

Client-based processing puts all the application logic on the client m/c with the exception of data validation routines, which are coded into the DBMS on server.
22. What are the major activities of a cooperative processing?
   - It uses a fully-cooperative peer-to-peer processing approach
   - The processing is performed, whenever computing resources are available
   - Data manipulating is performed on both client and server

23. What is the need of Host-Based Processing?
   - It has less functionality than other classes
   - It provide increased productivity
   - The presentation layer provides the user with an easy-to-use interface

24. Define End-User Productivity:
   - Flexible data access for end users was first provided by 4GL.
   - Increased productivity also result of close fit between the system design and the way users actually do their jobs.

25. What are the ways, the upsizing environment can be expanded?
   - Increasing memory and storage on the server
   - Swapping a more powerful processor into the server
   - Adding processors to the server.
   - Upgrading to more robust network software.

PART-B

1. Briefly explain about Categories of Client Server Applications?
   - Office systems,
   - Front end to existing systems,
   - Database access,
   - Transaction processing applications,
   - Investigate applications

2. Discuss Classes of Client Server Applications.
   - Host based processing,
   - Client based processing,
   - Cooperative processing

3. Explain Overview of Client Server Applications?
   - Components, classes and categories of Client Server Applications

   - Hardware trends, software trends, networking trends

5. Write notes on hardware, software and networking trends.
   - Hardware Trends
     - Power
     - Chips
     - Memory

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• Software Trends
  ➢ Relational Databases
  ➢ GUIs
  ➢ Multithreaded Processing
  ➢ Continuing Evolution

6. Discuss the benefits of client server computing.

• Dollar Savings
• Increased Productivity
• Flexibility and Scalability
• Resource Utilization
• Centralized Control
• Open Systems

7. Explain the components of client server computing.

• The Client
• The Server
• The Network

8. Discuss the overview of client server computing.

  ➢ What is Client/Server Computing
    o Client/server is a distributed computing model in which client applications request services from server processes and Servers receive those requests and perform actions such as database queries and reading files.

  ➢ Application Tasks
    o User interface
    o Presentation logic
    o Application logic
    o Data integrity

  ➢ Rightsizing
    o Downsizing
    o Upsizing
    o Smartsizing
UNIT-II

PART-A

1. **List out the myths of Client/Server Computing.**
   - Client/Server Computing is Easily Implemented
   - Current Desktop Machines Are Sufficient
   - Minimal Training Is Required
   - All Data Are Relational
   - Development Time Is Shorter

2. **List out the Obstacles-Upfront and Hidden of client server computing.**
   - Costs
   - Mixed Platforms
   - Maintenance
   - Reliability
   - Restructuring Corporate Architecture

3. **Define open system.**
   According to IEEE,”A comprehensive and consistent set of international information technology standard and functional standards profiles that specify interfaces, services and supporting formats to accomplish interoperability and portability of applications, data and people”.

4. **List out the Standards Areas of Client Server Computing.**
   Platforms, networks, middleware, applications

5. **Define portability.**
   It means that software will run on other platform without requiring modifications to application code.

6. **What is interoperability?**
   It means that the software can work with software on other platforms.

7. **List out the Existing Standards of Server Operating System.**
   UNIX, POSIX, TCP/IP, OSI, RDA & DRDA

8. **Define UNIX.**
   UNIX was developed by UNIX System Laboratories (USL), then a division of AT&T, as an OS for scientific, engineering and technical applications.
   Features of UNIX: Multitasking and Multiuser support.

9. **Define POSIX.**
   Portable Operating System Interface from IEEE. It is a UNIX based specification that is viewed as a standard for server OS.

10. **Define TCP/IP.**
    It is a de facto standard for Interconnecting otherwise incompatible computers. It is used to connect LAN based micros to corporate data on a UNIX host. TCP controls packet delivery and IP take care of interplatform and internetwork communications.

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11. Define OSI.
Open Standard Interconnection model was developed by the ISO to provide a common basis for communication system standard. It contains added features to support heterogeneous communications.

12. Define RDA.
Remote Data Access is an ISO’s RDA. Its focus is on multivendor, heterogeneous DB Interoperability. It is an ISO protocol for multisite transaction processing.

13. Define DRDA.
IBM’s Distributed Relational Database Architecture is to maximize support for existing applications. Its focus is on IBM interoperability.

- Standard based products and technology.
- Open development infrastructure.
- Management directives.

15. List out some standard setting organizations.
- Open Software Foundation
- UNIX International
- X/Open
- Object Management Group
- SQL Access Group

16. Define OSF.
It is a non-profit consortium of computer vendors, software developers and chip suppliers based in Cambridge.

17. List out some OSF standards.
- GUI standard (Motif)
- OSF/1
- DCE-Distributed Computer Environment and
- DME-Distributed Management Environment.

18. What is DCE?
DCE is announced in September 1991. It is a set of products provides necessary services for distributing applications in heterogeneous hardware and software environment.

19. Define DME.
DME is announced in Mid 1993. DME focus on the tools that are necessary to manage heterogeneous environments and designed for both UNIX and proprietary systems.

20. Give the UI’s standards.
- OSF’s DCE and SunSoft’s Open Network Computing technology.
- Adherence to OSI’s network standards
- GUI standards.

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21. Define X/OPEN.
Transaction Processing Working Group of X/OPEN Ltd.co., a London based international open system standards consortium, is working on the Distributed Transaction Processing (DTP) model.

22. What is CORBA?
Common Object Request Broker Architecture is a mechanism that allows object (applications) to call each other over a mixed network. It provides a high degree of portability.

23. What are the factors that lead to the success of client server computing?
- Internetworking
- Interoperability
- Compatible Environments
- Perceived Benefits (ease of use, cost savings, response time, functionality, accessible data, etc.)

24. What is X/Open’s XA protocol?
It specifies the interface between a transaction manager and multiple, heterogeneous distributed DBMS in an OLTP (On Line Transaction Processing) environment. XA supports two-phase commits, conversational transactions and other advanced OLTP functions.

25. Define SQL Access group.
It is an industry consortium working on the definition and implementation of specifications for heterogeneous SQL database access using accepted international standards. It is supported by most DBMS developers except IBM. It also supports TCP/IP as well as OSI protocols.

PART-B

1. Explain in detail about dispelling the Myths of client server computing?
- Client/Server Computing is Easily Implemented
- Current Desktop Machines Are Sufficient
- Minimal Training Is Required
- All Data Are Relational
- Development Time Is Shorter

2. Discuss Obstacles-Upfront and Hidden of client server computing.
- Costs
- Mixed Platforms
- Maintenance
- Reliability
- Restructuring Corporate Architecture

3. Explain Open Systems and Standards.
- Standards Areas
- Existing Standards
- Open Systems

4. Explain in detail about Standards-Setting Organizations.
- Open Software Foundation

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• UNIX International
• X/Open
• Object Management Group
• SQL Access Group

5. **Discuss about key Factors for Success of client server computing.**
   • Internetworking
   • Interoperability
   • Compatible Environments and Perceived Benefits

6. **Write short notes on open software foundation (OSF).**
   • GUI standards
   • OSF/1
   • Distributed Computer Environment (DCE)
   • Distributed Management Environment (DME)
UNIT-III

PART-A

1. Write down the function of the client in client server environment?
   - To perform the presentation functions and execute any business logic.
   - Presentation logic handles user interactions with applications.

2. What are the client components?
   Three client components
   - client hardware
   - client software
   - interface environments

3. Define client hardware
   The front end machine runs software that is responsible for the presentation and manipulation of data. The client software generates a data request and send it to the server. Then the client machine must be enough to run the required presentation software.

4. What are the software packages running on the client machine?
   - interface environment
   - Application logic
   - OS
   - Network OS

5. How the application logic processed?
   Application logic processed on the client machine require a compiler/a run time version of the client server application development tool used to generate the application.

6. What are the 3 standards of GUI?
   - Drag and drop
   - Control features
   - Standard dialogues.

7. What are the major GUI environments?
   - Windows from MS
   - Presentation manager from IBM
   - Motif from open software foundation.
   - Open look from UNIX system laboratories.

8. What are the popular OS used on client machine?
   - Microsoft’s MS-DOS
   - IBM’S OS/2
   - UNIX based OS

9. Give the disadvantages of DOS.
   - A 16-bit OS has been the memory ceiling of 640 Kbytes. Any memory over this limit is used for caching.
   - No memory management.

10. Define TSR.
    TSR = Terminate – Stay – and – Resident
    TSR software can be run in virtual machine and accessed via a hot key.

11. What are the 3 technologies in windows 3.X?
    - DLL (Dynamic Link Library)
12. Define DLL?

DLL allow routines to be coded as modules and linked by applications, as needed.


<table>
<thead>
<tr>
<th>DOS</th>
<th>Windows 3.X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single threaded.</td>
<td>Multi threaded.</td>
</tr>
<tr>
<td>No memory management.</td>
<td>It has own memory management.</td>
</tr>
</tbody>
</table>

14. What is OS/2?

- OS/2 is a 32-bit OS from IBM.
- It provides multitasking.
- OS/2 application runs in separate windows in the same screen.

15. List out the features of OS/2?

- Its use of named pipes, which allow processes to pass information to each other and are not hardware or software dependent.

16. Define DDE?

DDE’s used to exchange data between windows supported application.

17. Define OLE?

OLE’s used to create a compound document, which is a collection of objects with links to software tool that created it.

18. What is UNIX based OS?

- Operate in multitasking, multiuser environments
- Unix more typically used as a server OS
- Unix based OS, such as USL’s Unix system V release 4, IBM’s AIX and HP’s HP-UX.

19. What are the common events for GUI?

- Mouse events
- Keyboard events
- Window update events
- Resizing events
- Active/Deactive events
- Menu events
- Start/Stop events

20. List out the several modes for distributing the processing.

- Event loop
- Event call back
- Hybrid

21. What is event loop?

The event loop, which consists of an event handling routine and a dispatcher calls a specific library routine that checks for pending events. If there are any, the application dispatches an event handling routine before control is returned to the event loop.

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22. What is event call back?
   When an event is detected, the GUI calls the appropriate event routine for that entity. The event routine is called once for each event.

23. What are the 2 GUI camps?
   The 2 GUI camps,
   - X window
   - Windowing

24. What are the 2 major Xwindow environments?
   The 2 major Xwindow environments,
   - Motif
   - Open look

25. What are the major windowing environments?
   The major windowing environments,
   - Windows 3.X
   - Presentation manager
   - Macintosh
   - Next step from NeXT

26. What is the use of Xserver?
   Xserver program controls the display and provides an interface between itself and Xclients, which are usually application programs.

27. How to communicate with an Xserver?
   To communicate with an Xserver, an Xclient builds X protocol requests using a library of C routines.

28. What is the use of the Xwindows manager?
   Xwindow manager acts as an Xclient and it interacts with the client application through Xserver.

29. What is windowing and Xwindow?
   Windowing:
   - In windowing, each interface has its own look-and-feel. It provides the application logic processing + the application presentation logic.
   - The client is in control
   Xwindow:
   - Xwindow allows applications to access displays and networked client stations transparently. The client acts as a presentation server and the server runs a client for that presentation server.
   - The server is in control

30. List out the type of application logic?
   The type of application logic
   - Generated application logic
   - Customized application logic

31. What are the memory pools?
   - Local pool: it is specific to the application.
   - Global pool: it can be accessed by any program in the system.

32. Define winnet driver
   - winnet driver is the set of API's that bridge the window front-end with the network OS.
   - LAN Manager uses Winnet API's to browse n/w servers.
33. What are the OS/2 features?
   - Multitasking
   - DLL
   - Named pipes

34. What are the tools available in motif?
   - User interface X Toolkit: it contains the graphical object.
   - User interface language: it is used to describe the visual respects of motif GUI.

35. Write down the 3API's to develop the open look applications.
   The 3API's to develop the open look applications are,
   - Sun's News Development Environment API
   - AT&T's Xt+API
   - Sun's XView API

36. Define flashpoint
   Flashpoint was developed by viewpoint systems. It permits developers to add a front-end to existing 3270/5250 screens and perform data validation. It converts 3270/5250 screens by accessing their data streams and parsing the screens the screens.

37. What are the tools in data workbench?
   - Data entry
   - Utilities
   - Data dictionary
   - SQR(Structured Query Report Writer)

38. Define SQR
   It is a combination of SQL & a procedural programming language which can be used to develop reports within environment such as SYBASE, ORACLE.

39. List out the Activities in Quest Activity bar.
   - Table activity
   - Query activity
   - Report activity
   - Catalog activity

40. Give the Basic principles of effective GUI design
   - Know the users
   - Simplify often-used tasks
   - Provide feedback to the user
   - Be consistent
   - Test early and often

41. List out the Two categories of services
   - Portable GUI services
   - Portable application services

42. List out some Development Aids:
   - GUI
   - Data-access (SQL access and data dictionaries)
   - OLTP
PART – B

1. Briefly explain about Client Hardware and Software?
   - Client Hardware
   - Client Software

2. Discuss Client Components.
   - Client Hardware
   - Client Software
   - Interface Environments

3. Explain various Client Operating Systems?
   - DOS with Windows 3.x
   - OS/2
   - UNIX-Based

4. Discuss about GUI standards.
   - Screen Characteristics
   - Event Driven
   - Native API

5. Discuss merits and demerits of X Window and Windowing.
   - X Window GUIs
   - Windowing GUIs
   - Other Environments

6. Explain with neat sketch of Database Access?
   - SQL Interface
   - Extended SQL

7. Explain about Application Logic?
   - Generated Application Logic
   - Customized Application Logic

8. Explain various Client Software Products?
   - GUI Environments
     - Windows 3.x
     - Presentation Manager
     - Motif

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9. Discuss screen conversion 3270/5250.

- Easel
- Flashpoint
- Mozart.

10. Discuss about Database Access Tools.

- Accesspoint
- Builder Xcessory 2.0
- Data workbench
- Forest and Trees
- Impromptu
- Quest
- Sequelink

11. Explain various Client Requirements?

- GUI Design Standards
- Open GUI Standards
- Interface Independence
- Testing Interfaces
- Development Aids
  - Smart GUI interfaces
  - Smart SQL Interfaces
  - Data Dictionaries and Repositories
  - Smart OLTP Interfaces

12. Discuss testing interface in brief.

- Automatic Testing Facility
- SQA:Manager and SQA:Robot for windows
- Microsoft’s Test for Windows

13. Briefly explain about Development Aids?

- Smart GUI interfaces
- Smart SQL Interfaces
- Data Dictionaries and Repositories
- Smart OLTP Interfaces

14. Discuss about GUI Environments.

- GUI Environments
  - Windows 3.x
15. Discuss interface independence in brief.

Tools for building GUI:

- ALEX software
- Neuron Data Open Interface
- ORACLE Toolkit
- PC-XView
- XVT
1. List out the different types of server.
   - Database server
   - Data server
   - Compute server
   - Communication server
   - Application server
   - File server

2. List out Three benchmark tests:
   - Tpc-A
   - Tpc-B
   - Tpc-C

3. Define TPC:
   Transaction processing counsel (TPC). Vendors perform the benchmark tests using TPC provided guidelines for administering tests and reporting the results.

4. Give the Disadvantage of file server:
   - No scheduling of multiple users.
   - No cache management.
   - No lock manager.
   - Minimal concurrency control.

5. Define file server.
   - It manages a work group’s application and data files, so that they may be shared by the group.
     Very I/O oriented.
     File locking is used to handle by locking entire file.

6. Give the two techniques used to minimize the amount of data passes over the network:
   - Organizing data so that the data needed by a particular application request is stored in a single contiguous block.
   - Storing copies of data accessed by more than one user to help with concurrency problems

7. Define Application server:
   It is a machine that serves as a host replacement.

8. Define Data server:
   It is data oriented and used only for data storage and management. It doesn’t perform any application logic processing.

9. Define Compute server:
   It performs application logic on the results of the data requests before forwarding data to client.
   It requires processors with high performance capabilities and large amounts of memory but low disk subsystem capacity and throughput.

10. Give the Advantage of DB server:
    - Lock manager
    - Multi-user cache management
    - Scheduling
    - No need for redundant data.

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11. List out the Features of server machine
- Multiprocessing
- Multithreading
- Disk arrays
- Memory subsystems.
- Redundant components.

12. List out the two multiprocessing methods:
- Symmetric multiprocessing
- Functional multiprocessing

13. Difference between Symmetric and Functional multiprocessing

<table>
<thead>
<tr>
<th>Symmetric multiprocessing</th>
<th>Functional multiprocessing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It allow a task to be dynamically assigned to any processor.</td>
<td>Permanently assigns a set of task to a processor.</td>
</tr>
<tr>
<td>2. Processing resources are maximized.</td>
<td>Processing resources are minimized</td>
</tr>
<tr>
<td>3. A processor doesn’t sit idle if there is work to be done.</td>
<td>One processor may sit idle while another is overloaded.</td>
</tr>
</tbody>
</table>

14. Explain RAID
RAID-redundant arrays of inexpensive disks.
RAID can transparently recovery from the failure of any single drive and allow a faulted drive to be replaced while the server is online.

15. Define striping.
Data is actually broken into chunks and simultaneously written to multiple disks a process called striping.

16. What is the use of RAID and 5 levels?
**USE:**
It is for data protection and error connection.

**5 levels:**
- RAID-1: uses mirrored disks
- RAID-2: provide multiple parity
- RAID-3: used to maintain ECC(error correction code)
- RAID-4: uses ECC drives to provide data integrity and stripes files in blocks.
- RAID-5: perform simultaneous read by allowing multiple simultaneous write question.

17. Give the two version of RAID-1:
- Disk mirroring: uses two devices attached to the same disk controller.
- Disk duplexing: uses individual driller of each drive.

18. How to prevent corruption of data traveling within the server.
By using ECC memory and parity checking.

19. List out Classes of Server Machine:
- Micro/server
- Super server
- DB server machine
- Midrange computer/fault-tolerant machine.

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20. List out the Advantage over a micro/server:
   - Increase processing power
   - Increase I/O capability
   - Increase disk capacity
   - Improved reliability.
   - Increase maintainability and memory management.

21. List out two popular super server:
   IBM server 295
   COMPAQ systempro

22. List out Eight layer of software in server environment:
   - Network management environment
   - Network computing environment
   - Network OS
   - Server OS
   - Loadable modules
   - DB manager
   - DB gateways
   - Application

23. What are the products available in n/w management environment?
   - Distributed management environment(DME)
   - Object management architecture(OMA)
   - UI-Atlas

24. Define DME
   DME provides a framework for a vendor-neutral object-oriented, cost-effective environment that can be used by hardware and software vendors to develop products.

25. List out Four components of OME:
   ✓ ORB
   ✓ Object services
   ✓ Common facilities
   ✓ Application objects

26. What are the two set of services provided in DCC.
   - Basic distributed services
   - Data-sharing services

27. What are the tools provided by DCE?
   - RPC
   - Distributed directory service
   - Threads service
   - Time service
   - Security service

29. DCE and sunsoft’s open n/w computing architecture are similar, their major differences are:
   - Data translation
   - Location transparency
   - Transport independence
   - Multithreading
   - Security
30. Difference between DCE and ONC

<table>
<thead>
<tr>
<th></th>
<th>DCE</th>
<th>ONC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. independent of any OS</td>
<td>1. Relies on UNIX SVR4</td>
</tr>
<tr>
<td></td>
<td>2. support same OSI standards and greater OSI compliance</td>
<td>2. It was not designed to be an open std’s not OSI compliant.</td>
</tr>
</tbody>
</table>

31. What are the server requirements?
- Platform independence
- Transaction processing and Connectivity

32. Give ACID property:
- Atomicity
- Consistency
- Isolation
- Durability

33. Draw the diagram for 2PC

34. What are the locks available in locking schemes.
- Unlocked
- Shared lock
- Exclusive lock
PART- B

1. Discuss various Categories of Servers.
   - File Server
   - Application Server
   - Data Server
   - Compute Server
   - Database Server
   - Communication Server

2. Discuss Features of Server Machines.
   - Multiprocessing
   - Multithreading
   - Memory Subsystems
   - Redundant Components

3. Explain Classes of Server Machines?
   - Micro/Server
   - Superservers
   - Database Machines

4. Briefly explain about Server Environment?
   - Network Management Environment
     - Distributed Management Environment
     - Object Management Architecture
     - UI-Atlas
   - Networking Computing Environment
     - Distributed Computing Environment
     - Open Network Computing
   - Network Operating System

5. Explain Network Management Environment?
   - Distributed Management Environment
   - Object Management Architecture
   - UI-Atlas

   - Distributed Computing Environment
   - Open Network Computing
7. Explain various Server Requirements?

   Platform Independence
   Transaction Processing
     - Two-Phase Commits
     - Transaction Logs
   Connectivity
   Remote Procedure Calls

8. Discuss Platform Independence.

   - Transaction Processing
     - Two-Phase Commits
     - Transaction Logs
   - Connectivity
     - Remote Procedure Calls

9. Briefly explain about Transaction Processing?

   - Transaction Processing
     - Two-Phase Commits
     - Transaction Logs

10. Briefly explain about Connectivity?

    - Connectivity-Remote Procedure Calls

11. Explain various Server Data Management and Access Tools?

    - Data Manager Features
      - Standard SQL Access
      - Distributed Database Architecture
      - User Connections
    - Data Management Software
      - SYBASE SQL server
      - Microsoft SQL Server
      - SQLBase
      - Netware SQL
      - Other Options
    - Database Gateways
      - EDA/SQL
      - Database Gateway
      - SQL Bridge
      - SYBASE Open Client/Server

12. Discuss the features of data manager.

    - Standard SQL Access
13. Explain in detail about database gateways.

- EDA/SQL
- Database Gateway
- SQL Bridge
- SYBASE Open Client/Server

14. Briefly explain about Data Management Software?

- SYBASE SQL server
- Microsoft SQL Server
- SQLBase
- Netware SQL
- Other Options
UNIT-V
PART-A
Client/Server Groupware

1. Define Groupware
Client/server groupware is a collection of technologies that allow us to represent complex processes that center around collaborative human activities. It builds on five foundation technologies: multimedia document management, workflow, e-mail, conferencing, and scheduling.

Synonyms for groupware—collaborative computing, workgroup computing, knowledge management, and the academic sounding "computer-supported cooperative working."

2. How is Groupware Different From SQL Databases?

The relational databases deal with highly structured data that is accessed using SQL. They are excellent for managing applications that require high concurrency controls—including locking and isolation features—that are needed for immediate updates. They also provide excellent ad hoc query facilities.

In contrast, groupware deals with highly unstructured data—including text, image, graphics, faxes, mail, and bulletin boards. Groupware provides the tools to capture this data at the point of entry and organize it in a nebulous thing called a document. You can think of a document as the container of diverse types of information. The document is to a workgroup what a table is to an SQL database: It's a basic unit of management. Groupware helps end users create document databases. It can move these documents via electronic mail and database replicas. And it provides everything you need to query, manage, distribute, and navigate through document databases. Documents are the currency of groupware.

3. How Is Groupware Different From TP Monitors?

The TP Monitors deal with management of transaction-aware applications across client/server networks. So how do they compare with groupware? When it comes to document stores, TP Monitors can complement groupware software very well. The TP Monitor treats the document store like any other resource manager. If it supports a two-phase commit, the TP Monitor will gladly coordinate a distributed transaction that includes the document store. However, TP Monitors and groupware compete in the area of workflow. We believe that the groupware workflow is a much more developed technology than the TP Monitor long-lived transaction (but it's less protected).

4. List out the Components of Groupware.
   - Multimedia documents
   - Workflow
   - Email
   - Group conferencing
   - Group scheduling


Workflow is the "up and coming" client/server technology that can be used to automatically route events (and work) from one program to the next in structured or unstructured client/server environments. The "classical" workflow paradigm is a river that carries the flow of work from port to port and along the way value gets added. Workflow defines the operations that must be visited along the way and what needs to be done when exceptions occur. The original work item may be merged with other work, transformed, or routed to another workflow. It's quite a dynamic environment. Some workflows may be fuzzy and not understood very well; others are deterministic and highly repetitive. In all cases, these workflows are there to help us collaborate in getting work done.

6. List out the Workflow Models
   Routes, Rules, and Roles.
• **Routes** define the paths along which the object moves. They also include definitions of the objects—documents, forms, events, electronic containers and parts, messages, and so on—that are to be routed.

• **Rules** define what information is routed and to whom. Rules define both the conditions the workflow must meet to traverse to the next step and how to handle exceptions: "If the loan is over $100,000, send it to the supervisor or else send it to the next hop."

• **Roles** define job functions independently of the people who do it. For example, the "supervisor" role can be handled by users "Mary" and "Jeri." Any one of these people can do the job; just put the job on the next available supervisor's queue.

7. **List out the Workflow Routes**

Sequence router, parallel router, feedback loop router, circular router, wheel spoked router, fully interconnected router.

8. **List out Workflow Splits and Joins**

- And-Splits
- Or-Splits
- Or-Joins
- And-Joins

![And-Split, Or-Split, Or-Join, And-Join](image)

9. **Give the components of the Internet Mail Protocols:**

- SMTP, IMAP, and POP
- POP3
- IMAP4
- SMTP
- S/MIME

10. **Give the two types of Group Conferencing**

- Real-time conferences
- Anytime conferences Client/Server and the Internet

11. **Draw the Web Client/Server Interaction.**

![Web Client/Server Interaction](image)

A Web Client/Server Interaction.
12. Give the URL Structure

   
   Process-oriented workflows are used to automate business systems that have definable, repetitive, and well-understood policies and procedures. For example, a mortgage loan is an understood business process that goes through a prescribed set of procedures. Loans are processed in the same way every day. The routing of the work is automatic and requires very little user involvement. It's like taking a train. This type of workflow is a natural candidate for TP Monitor initiated Sagas or long-lived transactions.

   
   It deals with short-lived and unstructured work processes. They can involve task forces of people working on a common problem. Consider a short-duration project with a deadline. The workflow is used to assign roles, track and route work-in-progress, monitor deadlines, and track who got what and when. It's an excellent tool for tracking work among people who are physically dispersed. This type of workflow is like driving a car. The navigation is driver-centric, but you need road signs and a map to figure out where you're going. The driver also needs to know the set of options available at every turn. Ad hoc workflow is used for incremental automation—leaving anything the system can't handle to humans. It takes full advantage of desktop power to help humans navigate through the country roads.

15. List out the types of HTML Lists
   - unordered lists
   - ordered lists

   HTML Lists.

16. Give the syntax for Embedding Images in Documents
   
   You embed an image in your documents with the <IMG> tag. This tag includes an attribute—called SRC—that contains the URL of the external picture file or the name of a local file. For example, <IMG SRC= "zog.gif">. Attributes only appear in the first tag of tag-pair; they provide additional directives to the browser.

17. Give the Hyperlink syntax.
    
   Eg: <A HREF="Target URL"> This is a hot link</A>.

18. Define Cascading Style Sheets
   
   Cascading style sheets (CSS) give you almost total control of the layout and formatting of HTML documents. As the term "cascading" implies, more than one style sheet can be used on the same document. For example, you can embed a style sheet in each document or as an attribute for a particular element. Or, you can use a common style sheet for standardizing the look-and-feel of all the documents on your Web site. You do this by referencing the standard style sheet from within each document. The styling rules within the document override the external style sheets. So "cascading" means resolving the sequence of styling rules that apply to a document or elements of a document. The rules are resolved from the inside out.
19. Draw the 3-Tier Client/Server, Web-Style

![3-Tier Client/Server](image)

20. Write note for The Form Tag in HTML.

A form begins with `<FORM>` and ends with `</FORM>`. By convention, you visually separate the FORM contents from the rest of an HTML document with a horizontal line (or HR tag). A document can contain one or more forms, but they can't be nested within each other.

The `<FORM>` tag has two mandatory attributes: METHOD and ACTION. The METHOD can be either an HTTP GET or POST; it specifies how the data entered in the various fields of the form is transmitted to the CGI server application. The ACTION attribute specifies the URL to which you send the form's contents; it must be the name of a server CGI program (or script) that can process the form's data. Here's an example of a FORM tag:

```html
<Form method="POST" action="HTTP://www.mylab.org/cgi-bin/sampleform">
```

21. List out the Eight types of inputs with the HTML tag.

```html
<label type="field type" name="Name of field" value="default value">
- Text
- Password
- Hidden
- Checkbox
- Radio
- Reset
- Submit.
- Image
```

22. Give the SELECT Field syntax in HTML.

A SELECT tag lets you create a dropdown list box from which a user picks one or more items (or options). The selected items become the values associated with the SELECT tag's NAME attribute. If you pick more than one item, the browser will generate a "name/value" pair for each item you pick. The syntax for the SELECT tag is:

```html
<select name="Name of field" size="N" multiple>
<option>choice 1
<option>choice 2
.
<option>choice N
</select>
```
23. Give the TEXTAREA Field syntax in HTML.

   The TEXTAREA tag lets you create multiline data entry fields. In contrast, the INPUT type allows for only single-line text input. So a text area is simply a two-dimensional text box. The syntax for the TEXTAREA tag is:

   ```html
   <TEXTAREA NAME= "Name of field" ROWS="Visible rows" COLS="Visible columns">
       Default Text goes here
   </TEXTAREA>
   ```

   The TEXTAREA attributes, ROWS and COLS, let you specify the number of visible rows and columns in the text area. This is the field's visible dimension specified in character units. Most Web browsers let you scroll the text beyond these limits; they typically render the field's contents in a fixed-width font. You can optionally place some initial text between the TEXTAREA start and end tags. This lets you put some words in your user's mouth when the form is first displayed.

24. Write note on HTML Tables.

   The table tag is a very useful HTML extension that is now supported in most browsers. With the exception of a few enhancements, the tables these browsers implement are as described in the HTML 3.2 (and above) specification. In a Web client/server context, tables allow a CGI program to dynamically format the result of searches in a row/column grid format. So it is useful to give you a quick overview of how to create these tables in HTML.

   A table begins with the `<TABLE>` tag and ends with `</TABLE>`. You must enclose the table elements with the surrounding `<TABLE>` tag pairs. HTML defines four main tags for creating table elements:

   - `<TR>..<TR>` defines a single table row. The number of rows in a table is exactly specified by how many of these tags it contains.
   - `<TD>..<TD>` defines a single data cell within a table row. A cell may contain any of the HTML tags normally present in the body of an HTML document.
   - `<TH>..<TH>` defines a header cell within a table row. A header cell is identical to a data cell in all respects, except that the text it contains is bold and centered (the default).
   - `<CAPTION>..<CAPTION>` lets you add captions to your tables. A caption can either appear at the bottom or at the top of a table; the default is top. Captions are always horizontally centered with respect to the table.

25. Define Hidden Fields

   Hidden fields are basically invisible; they contain values that are not displayed within a form. They are used to store information a user enters and resubmit that information in subsequent forms without having the user reenter it or even be aware that the information is being passed around. In other words, the hidden fields act as variables that maintain state between form submissions. So how does this information get passed from one form to another? It gets passed through the CGI program.

26. Define Cookies

   Cookies provide another variation of this hidden field approach. A cookie is a small piece of data that is stored in the client on behalf of a server. In essence, a cookie is an invisible field that is stored on the client for a specified time. Typically, servers use cookies to store user IDs or basic configuration information. The cookie is sent
back to the server in subsequent page requests from this client. By default, cookies are only returned to the server that creates them. Of course, there are ways to change this default.

SQL Database Servers

27. What Does SQL Do?

The SQL language is used to perform complex data operations with a few simple commands in situations that would have required hundreds of lines of conventional code. Physicists might call SQL "the grand unified theory of database" because of the multifaceted roles it plays. Here is a partial list of roles:

- SQL is an interactive query language for ad hoc database queries.
- SQL is a database programming language.
- SQL is a data definition and data administration language.
- SQL is the language of networked database servers.
- SQL helps protect the data in a multiuser networked environment.


SQL-89, SQL-92, and SQL3

29. Define SQL-89

The SQL-89 standard was an "intersection" of the SQL implementations of that time, which made it easy for existing products to conform to it. SQL-89 was a "watered-down" SQL that made the term "SQL compliant" almost meaningless. The DBMSs of the time would usually add DB2 compliance to their checklist of compliances. And even that didn't mean too much, at least in terms of creating a unified SQL.

30. Define SQL-92

The ISO SQL-92 (also called SQL2), ratified in late 1992, is over five times the length of the original SQL-89 standard. SQL-92 standardizes many of the features previously left to the implementor's discretion (i.e., the loopholes); it is essentially a superset of SQL-89. C.J. Date warned that it was going to take a big implementation effort to bring the current relational databases to SQL-92 standards. He was right. It took over five years to get there. To make it easier on the vendors, ISO defined three levels of compliance: entry, intermediate, and full. To help you understand where you're at, the SQL-92 standard introduces the concept of a flagger—a program that examines the source code and "flags" all SQL statements that do not conform to SQL-92.

31. List out the Features of SQL-92 standard

- SQL-agents
- SQL client/server connections
- More granular transaction controls
- Standardized catalogs for describing the structure of a database
- Embedded SQL support for new languages
- Support for dynamic SQL
- Support for new data types
- Support for temporary tables
- Support for join operators
- Standardized error codes and diagnostics.
- Domain checks and constraints
- Miscellaneous improvements
32. List out the SQL3 parts

- Part 1, SQL/Framework
- Part 2, SQL/Foundation
- Part 3, SQL/CLI
- Part 4, SQL/PSM
- Part 5, SQL/Bindings
- Part 6, SQL/Transactions
- Part 7, SQL/Temporal
- Part 9, SQL/Med
- Part 10, SQL/OLB

33. What Does a Database Server do?

In a database-centric client/server architecture, a client application usually requests data and data-related services (such as sorting and filtering) from a database server. The database server, also known as the SQL engine, responds to the client's requests and provides secured access to shared data. A client application can, with a single SQL statement, retrieve and modify a set of server database records. The SQL database engine can filter the query result sets, resulting in considerable data communication savings.

A generic SQL server manages the control and execution of SQL commands. It provides the logical and physical views of the data and generates optimized access plans for executing the SQL commands. In addition, most database servers provide server administration features and utilities that help manage the data. A database server also maintains dynamic catalog tables that contain information about the SQL objects housed within it.

Because an SQL server allows multiple applications to access the same database at the same time, it must provide an environment that protects the database against a variety of possible internal and external threats. The server manages the recovery, concurrency, security, and consistency aspects of a database. This includes controlling the execution of a transaction and undoing its effects if it fails. This also includes obtaining and releasing locks during the course of executing a transaction and protecting database objects from unauthorized access.

34. List out the three types of SQL Database Server Architectures:

- Process-per-client architectures
- Multithreaded architectures
- Hybrid architectures

35. Draw the Process-per-Client Database Server Architecture:
36. **Draw the Multithreaded Database Server Architecture:**

![Multithreaded Database Server Architecture](image1)

37. **Draw the Hybrid Database Server Architecture:**

![Hybrid Database Server Architecture](image2)

38. **What Is a Stored Procedure?**

The major database vendors are now offering an RPC-like mechanism for executing functions that are stored in their databases. This mechanism is sometimes referred to as "TP-Lite" or "stored procedures." A stored procedure is a named collection of SQL statements and procedural logic that is compiled, verified, and stored in the server database. A stored procedure is typically treated like any other database object and registered in the SQL catalog. Access to the stored procedure is controlled through the server’s security mechanisms.

Stored procedures accept input parameters so that a single procedure can be used over the network by multiple clients using different input data. The client invokes a remote procedure and passes it the parameters required to do a job. A single remote message can trigger the execution of a collection of stored SQL statements. The result is a reduction of network traffic, which should provide better performance.

39. **Define Static and Dynamic SQL:**

Static SQL statements are defined in your code and converted into an access plan at program preparation time. The SQL statement is known before your program is run. The database objects need to exist when...
precompiling static SQL statements. You can think of static SQL as being a compiled form of the SQL language. Static SQL is a performance enhancement feature.

Dynamic SQL statements are created and issued at run time. They offer maximum flexibility at the expense of execution speed. You can think of dynamic SQL as an interpretive form of the SQL statements. The compilation of dynamic SQL statements is done at run time and must be repeated every time the same statement gets executed again.

40. Define Triggers and Rules

Triggers are special user-defined actions—usually in the form of stored procedures—that are automatically invoked by the server based on data-related events. Triggers can perform complex actions and can use the full power of a procedural language. A rule is a special type of trigger that is used to perform simple checks on data. Both triggers and rules are attached to specific operations on specific tables. In other words, an event tells you something happened to the database; a trigger or rule is an event handler you write to take the proper action in response to that event (see Figure 10-6).

![Figure 10-6: The Mechanics of SQL Triggers.](image)

41. Define JDBC

JavaSoft's Java Database Connection (JDBC) is a portable SQL CLI written entirely in Java. It lets you write DBMS-independent Java code. Like ODBC and ISO SQL/CLI, JDBC provides two major sets of interfaces: 1) an application interface that lets you access SQL services in a DBMS-independent manner, and 2) a driver interface that DBMS vendors must adapt to their particular databases. Like the other CLIs, JDBC uses a driver manager to automatically load the right JDBC driver to talk to a given database (see Figure 5.7).

![Figure 5.7: The Layers of JDBC](image)

42. Define JDBC Drivers

DBC drivers are either direct or ODBC-bridged. A direct driver sits on top of the DBMS's native interface. For example, Symantec provides direct drivers for Oracle using OCI, Sybase using DB-Lib, and Microsoft SQL Server and Access using ODBC. In contrast to direct drivers, bridged drivers are built on top of existing ODBC drivers. JDBC is patterned after ODBC. Consequently, the translation between these two protocols should be minimal. JavaSoft and Intersolv provide a reference JDBC-to-ODBC bridge implementation that makes it easier to translate between JDBC and the various ODBC drivers.
43. Give JDBC URL Naming

URL-based naming scheme:

```
jdbc:<subprotocol><domain name>
```

For example, the URL to access "MyJavaDB" via a JDBC-to-ODBC bridge might look like this:
```
jdbc:odc://www.bob.com/MyJavaDB
```

In this example, the subprotocol is "odbc" and the hostname is "www.bob.com." You can also use this scheme to provide a level of indirection in database names. You do this by specifying a naming service as the subprotocol. Here's an example of a URL that does this:
```
jdbc:dcenaming:MyJavaDB
```

In this example, the URL specifies that the DCE naming service is used to resolve the database name "MyJavaDB" into a global name that connects to the database. JDBC recommends that you provide a pseudo-driver that looks up names via a networked name server. It then uses the information to locate the real driver and pass it the connection information.

44. Draw the JDBC 2-Tier

![JDBC 2-Tier](image)

```
JDBC 2-Tier.
```

45. Draw the JDBC 2-Tier Plus

![JDBC 2-Tier Plus](image)

```
JDBC 2-Tier Plus.
```
46. Draw the JDBC 3-Tier

![JDBC 3-Tier Diagram]

47. Define OLE DB

OLE DB defines a set of interfaces (and classes) that mediate between data providers and data consumers. Data providers are OLE DB components that represent a specific data source—SQL data, spreadsheets, file systems, directories, multi-dimensional data, e-mail messages, Web pages, and so on. Providers return data using an OLE DB abstraction called a rowset; it's a table that can also contain embedded tables in its columns.

48. Define ADO

ADO is a higher-level programming model for OLE DB; it's a replacement for two Microsoft data access protocols—Data Access Object (DAO) and Remote Data Objects (RDO). ADO supports a variety of front-end tools and programming languages—including Visual Basic, PowerBuilder, Delphi, Java, and JavaScript. It also provides a Remote Data Service (RDS) component that supports client-side caching (with updates) and data-aware controls. The ADO object model consists of: 1) connection objects that represent a connection to a data source, 2) command objects that represent a query (or command) to be executed on the data source, and 3) a recordset object that represents the results of the query. This model should be quite familiar if you program with JDBC (or ODBC).

49. What is IBI EDA/SQL?

Enterprise Data Access/SQL (EDA/SQL), from Information Builders Incorporated (IBI), is a family of open gateway products that uses SQL to access over 72 relational and non-relational database servers—an industry record. EDA/SQL is a continuation of IBI's twelve-year experience in developing gateway code primarily for read-only query access. According to IDC, IBI now owns over 10% of the data access middleware market; its 1997 data access revenues grew by 24% to $62 million. This puts IBI in the number-one spot in terms of marketshare.

50. List out some EDA/SQL components.

- API/SQL
- EDA/Extenders
- EDA/Link
- EDA/Server
- EDA/Data Drivers
PART-B

1. Write notes on ISO standards.
   - SQL-89
   - SQL-92
   - SQL-3

2. Discuss SQL database server architecture.
   - Process-per-client architectures
   - Multithreaded architectures
   - Hybrid architectures

3. Write notes on JDBC.
   - JDBC drivers
   - JDBC URL naming
   - JDBC 2-TIER
   - JDBC 2-TIER PLUS
   - JDBC 3-TIER

4. Explain IBM’s DRDA in detail.
   - Remote request
   - Remote unit of work
   - Distributed unit of work
   - Distributed request
   **DRDA features:**
   - SQL message content and exchange protocol.
   - Transport stack independence.
   - Multiplatform program preparation
   - Static or dynamic SQL support
   - Common diagnostics
   - Common SQL syntax.

5. Explain in detail about elements of data warehouse and data mining.
   **Elements of data warehouse:**
   - The data replication manager
   - The informational database
   - The information directory
   - EIS/DSS tool support
   **Data mining:**
   Data mining lets the power of computers do the work of sifting through your vast data stores. Tireless and relentless searching can find the tiny nugget of gold in a mountain of data slag.
   Most tools use the following search methods:
   - **Associations**—often called market basket analysis—look for patterns where the presence of something implies the presence of something else. For example, "Scuba gear buyers are good candidates for Australian vacations."
   - **Sequential patterns** look for chronological occurrences. For example, "When the price of stock X goes up by 10%, the price of stock Y goes down by 15% a week later."
   - **Clusterings** look for groupings and high-level classifications. For example, "Over 70% of undecided voters have incomes of over $60,000, age brackets between 40 and 50, and live in XYZ neighborhood." The idea is to group similar entities based on their affinities.

6. Discuss the mechanics of data replication
• Refresh and Updates  
• Staging the Updates  

Cleansing and Transforming the Raw Data  
• Subsets allow you to transmit only the rows and columns that are of interest to your informational applications. You use SQL once to define your subsets to the copy tool, and these subsets will be performed automatically as part of the copy. In addition, different views of the same source data can be delivered to different copy targets. Multitable joins can also be used to define the copy transforms.  
• Aggregates allow you to transmit only the aggregations of data such as averages, sums, maximums, and so on. Again, you specify this once using SQL, and the copy tool will perform the aggregate every time a transfer takes place.  
• Derived functions allow you to specify data that does not exist but is the result of some calculation (or function) on data that does exist. For example, a new column of data may be defined on the target database that is the sum of two columns on the source database. The new column will automatically get created and updated as part of the automated copy process.  
• True Replicas  

7. Explain OLAP in detail.  
Online Analytical Processing (OLAP) tools create multi-dimensional data views on top of ordinary 2-D SQL databases (or using specialized multi-dimensional databases). OLAP's multi-dimensional access lets you formulate more sophisticated queries, and then look at the results accordingly.  

OLAP split into four camps  
• Desktop OLAP.  
• Multi-dimensional OLAP (MOLAP).  
• Relational OLAP (ROLAP).  
• Hybrid OLAP (HOLAP).  

OLAP Client/Server Interaction  
• The client invokes the OLAP application and submits a command. An OLAP application can be invoked from within a spreadsheet, Web page, or visual tool. The client application displays a user interface and submits commands to the OLAP engine on the server.  
• The server executes the command. Typically, the server performs the calculations on multi-dimensional data stored in an RDBMS, MDBMS, or both.  
• The server returns the results to the client. The results are then displayed inside the visual tool or in a spreadsheet.  
• The client optionally caches the results. The client may maintain a local hypercube with cached results.  

8. Discuss the components of groupware.  
Synonyms for groupware—collaborative computing, workgroup computing, knowledge management, and the academic sounding "computer-supported cooperative working." Groupware is the easiest of these terms to remember; vendors like the way it sounds because of the "ware" attached to it. So groupware it is.  

Components of groupware:  
Multimedia documents  
• a. Electronic Imaging Client/Server Architecture  
• b. Groupware Multimedia Document Management  
Workflow  
• a. The New Workflow Systems  
• b. Workflow Models  
• c. Workflow Routes  
• d. Workflow Splits and Joins  

S.SAKTHI,AP/IT
Email
a. The Electronic Mail Infrastructure
b. The Internet Mail Protocols: SMTP, IMAP, and POP
c. The E-Mail APIs: VIM, MAPI, and JavaMail

Group conferencing
- Realtime conferences
- Anytime conferences

Group calendaring and Group scheduling

9. How The Web Protocols Play Together?
The first-generation Web applications are built on the following technologies and protocols:
- The Internet is the global backbone.
- The Internet is the private backbone.
- URLs are used to globally name and access all Web resources.
- HTTP is used to retrieve URL-named resources.
- HTML is used to embed hyperlinks and to describe the logical structure of Web documents.
- Web browsers are universal clients.

10. Write notes on HTML.
- How To Mark Up Text in HTML
- How To Mark Up Text in HTML
- How To Structure the Flow of Text in an HTML Document
- HTML Lists
- Embedding Images in Documents
- Hyperlinks
- Cascading Style Sheets
- HTML Versions

11. Write notes on HTTP.
- HTTP Data Representations
- So What Does an HTTP Request Look Like?
- So What Does an HTTP Response Look Like?

12. Explain 3-Tier Client/Server, Web-Style.
- HTML's Web-Based Forms
- The Form Tag
- The Form Interface Elements
  a. INPUT Fields
  b. The SELECT Field
  c. The TEXTAREA Field
- HTML Tables

13. Discuss CGI and its state in brief.
   CGI Scenario:
   1. User clicks on the form's "submit" button.
   2. The Web Browser invokes a POST HTTP method.
   3. The HTTP server receives the method invocation via a socket connection.
   4. The HTTP server sets up the environment variables.
   5. The HTTP server starts a CGI program.
   6. The CGI program reads the environment variables.
   7. The CGI program receives the message body via the standard input pipe (stdin).
   8. The CGI program does some work.
9. The CGI program returns the results via the standard output pipe (stdout).
10. The HTTP server returns the results to the Web browser.

**CGI state:**
1. Hidden Fields
2. Cookies