KONGU ENGINEERING COLLEGE
(AUTONOMOUS)

DEPARTMENT OF CSE

CAT - II - ANSWER KEY

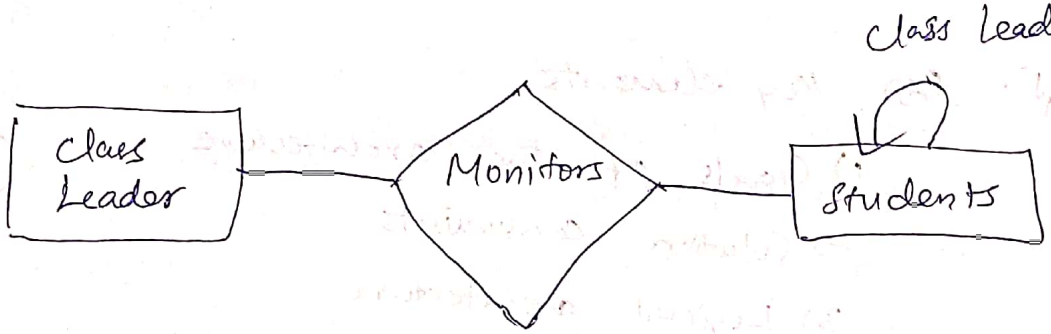
20CSE03 - BUILDING ENTERPRISE APPLICATIONS.

PART - A.

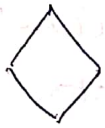
1. Architecture - Blueprint for guiding the design of an application.

   * Outlines the structural components & layout of application.
   * defines the structure & organisation of an appln.
   * Specifies how different components, modules & layers will interact & can be arranged.
   * Also provides guidelines for construction by providing patterns for software development including choice of technologies. (2m)

2. ER diagram to show recursive relationship.




Entity


Relationship.

(2m)

3. Synchronous & Asynchronous communication.

- Synchronous communication assumes the availability of the receiving application for communication to succeed.
- The sender appln receives an error notification almost immediately.
- Based on request-reply model. Uses RPC.

- In asynchronous communication, application resumes processing irrespective of the state of receiving appln and the availability of response.
- Communication is normaly achieved using JMS.
- More fault tolerant. (2m)

4. Incorporating responsive design principles - presentation layer.

- Cross-Device compatibility
- Improved user experience
- Higher engagement
- Cost effective. (2m)

5. SAD key elements.

1) Goals of the architecture
2) Solution constraints
3) Logical architecture
4) Quality of services
5) Technology selection
6) Data architecture etc.

(Any 4) (2m)

6. Inclusion of middleware leads to, (Any 4)

* Interoperability
* integration of heterogeneous systems (2m)
* Simplified data exchange
* enhanced scalability
* Cross platform compatibility
* security & governance .. etc

7. Storage Area Network.

- Specialized, high speed network
- designed to provide block-level data storage & access to a diverse set of storage devices & servers.
- Typically used to connect storage resources like storage arrays, disk drives to multiple servers & ensure efficient & centralized data storage management. (2m)

8. SAX, DOM, StAX

SAX - (Streaming API for XML)

- A pull-parsing model for XML data.
- Provides balance between the streaming capabilities of SAX and in-memory representation of DOM.

DOM - (Document Object Model)

- Used when we need to manipulate, query, and work with XML data in a more structured manner within memory. (2m)

StAX - (Streaming API for XML)

- parser, also has the capability to read large documents. provides more flexible alternatives to process XML streams

9. Approaches to design session management.

- Server side session management
- client side session management
- Token based session management
- Database - backed session management
- Distributed session management.
- Time limited sessions

(Any 4). (2m)

10. Service Oriented Architecture.

- an architectural approach, promotes design & development of software design and development of software systems as a collection of loosely coupled & interoperable services. (1m)

Enterprise Service Bus

- Software component - serves as a central communication and integration hub within an enterprise's SOA. (1m)

Part - B.

11. LoMS integration architecture.

Integration layer provides

- the capability to connect to the external systems through their exposed interfaces.

Integration Types

- UI integration
- Functional integration
- Data integration. — (5m)

Evolution of integration techniques

- Third party
- Java based
- web services

LoMS integration landscape of XYZ company with Integration Layer components (block diagram) (5m)

12. Data Access Layer design challenges.

1) Performance considerations
2) Object relational mapping
3) Handling XML data
4) Security considerations
5) Integration of distributed data (5 m)

To propose improvements, best design practices can be followed like,

1) In dynamic queries that include user input data, ensure that it is always validated to minimize the possibility of an SQL injection attack
2) Avoiding idle database connections
3) Co-locating data access layer with business layer to improve performance.
4) Consider caching of frequently accessed data. (5 m)

13. Middlewares

- Software glue that binds together the software pieces of the distributed application & enables integration of discrete enterprise applications & their components.

1) MOM - Message oriented Middleware
2) RPC - Remote Procedure Call (5 m)

Roles

1) Integration & interoperability
2) Data transformation & mediation
3) ~~Significa~~ Message queues & publish-subscribe
4) Security & Access Control
5) Scalability & load balancing
6) Error handling & logging
7) Service orchestration

(5 m)

14. IT hardware & software

Key considerations & strategies for selecting components to ensure efficient & secure operations..

Hardware

1) Hardware specifications
2) Scalability
3) Redundancy & Reliability
4) Security features
5) Energy efficiency
6) Remote management.

(5 m)

Software

1) Operating systems
2) Security software
3) Productivity software
4) ERP & CRM
5) Data backup & Recovery
6) Scalable databases.

(5 m)

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