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BE Degree Examination December 2022

Fifth Semester

Computer Science and Engineering

20CSE03 – BUILDING ENTERPRISE APPLICATIONS

(Regulations 2020)

Time: Three hours

Maximum: 100 marks

Answer all Questions

Part – A ($10 \times 2 = 20$ marks)

1. Name the any four activities involved in incepting an Enterprise Application. [CO1,K1]
2. How does adherence to budget and schedule lead to successful enterprise application? [CO1,K1]
3. List any four domains of an enterprise architecture frame work. [CO2,K1]
4. State the purpose of object relational mapping (ORM) in the implementation of data access layer. [CO2,K2]
5. What is virtualization? [CO3,K1]
6. Mention the role of rules engine in an enterprise application. Name any two rules engines. [CO3,K2]
7. Relate the Enterprise application testing matrix distributed across the development life cycle. [CO4,K1]
8. What do you mean by dependency injection? [CO4,K1]
9. Highlight the objective of user acceptance testing. [CO5,K1]
10. When do you prefer up-down-up rollout? [CO5,K1]

Part – B ($5 \times 16 = 80$ marks)

11. a. Imagine you are a project leader of an Enterprise application. You have to recruit team members for developing that project. What are the skills required to develop the project? How do you recruit team members? Explain. (16) [CO1,K3]

(OR)

- b. i) Construct the use case specification document for “initiate loan” use case. (8) [CO1,K3]
- ii) Explain the various activities to be performed by a business analyst during enterprise analysis. (8) [CO1,K3]
12. a. i) Illustrate different kinds of relationships that may exist among classes in object oriented paradigm. (8) [CO2,K2]
- ii) Explain the best practices used to design the technical layers of an n-tire enterprise application. (8) [CO2,K2]

(OR)

- b. KYB is a leading global bank, head quartered in Coimbatore. It offers various services to customers. The core banking segment offer loans to its retail customers. In order to current business trends, the bank management decided to expand the loan services to customers through multiple channels. At earlier stage bank issue loan only through bank branch. The pre approved loan amount is decided based on customer relationship with the bank. All the verification and approval processes are done by the bank representatives. There is no external agency interface to provided customer credit rating. Now the bank management would like to upgrade the system. To meet our current trends the management introduces custumate loan offering system to new customer via bank branches and internet. To get a loan a customer has to register and fill the particulars either through the internet or bank representatives. The information about preapproved loan amount will be made available to the customer at the time of loan initiation. The customer can either choose to go with the preapproved loan amount or opt for a higher amount by placing a request for enhancement of the loan amount. Draw technical architecture. (16) [CO2,K2]

13. a. i) How do you document the results of architecture and design phase which are essential during the construction phase of your own application development. (8) [CO3,K3]
 ii) Networking, communication protocols and IT hardware and software play a crucial role in the operation of an enterprise application. Explore the building blocks of the above. (8) [CO3,K3]

(OR)

- b. Consider a tourism management system to demonstrate the interaction between business delegate and business service with a neat sketch. Also explain the steps to perform request processing in the business layer. (16) [CO3,K3]

14. a. i) State the objectives of static code analysis. (8) [CO4,K2]
 ii) How does code profiling help in tuning the performance of an application. (8) [CO4,K2]

(OR)

- b. Enumerate the list of typical elements that are setup as part of a development environment. (16) [CO4,K2]

15. a. Demonstrate the test cases used in globalization testing and user acceptance testing. (16) [CO5,K2]

(OR)

- b. Consider an exam registration process test case. Apply the globalization and user acceptance testing. (16) [CO5,K2]

Bloom's Taxonomy Level	Remembering (K1)	Understanding (K2)	Applying (K3)	Analysing (K4)	Evaluating (K5)	Creating (K6)
Percentage	16	52	32	-	-	-

Part-A

1. Name the four activities involved in incepting an enterprise application
 - Enterprise analysis
 - Business modelling
 - Requirement elicitation and analysis
 - Requirement validation
 - Planning and estimation
2. How does adherence to schedule and budget lead to successful enterprise application
 - Budget and schedule adherence in raising an enterprise application is one of the key parameter from perspective of the enterprise application development teams. Overruns of budgets and exceeding the timelines have direct impact on the time to production and cost effectiveness parameters. The enterprise applications program management team has the bottom-line responsibility for fulfilling this success this success parameter.
3. List the four domain of enterprise application
 - a. Business architecture
 - b. Application architecture
 - c. Data Architecture
 - d. Technology Architecture
4. Purpose of Object relational mapping in the implementation of Data Access Layer
 - It is important to ensure that they are configured and tuned for efficient mapping between the object and relational model
5. What is the virtualization?
 - a. Virtualization is mechanism to abstract IT infrastructure
 - b. It can be viewed as design pattern in the IT infrastructure and is implemented at different level like platform or system resource level
 - c. Achieve consolidation of platform and resource through sharing
6. Mention the role of rules engine
 - a. Networking, internetworking and communication protocols
 - b. IT Hardware and software
 - c. Middleware
 - d. Policies for infrastructure management
7. Enterprise application testing matrix distributed across development life cycle
 - Requirement traceability matrix helpful to development EA
8. What do you mean by dependency injection?
 - One of the dread application security vulnerabilities. This allows the attacker to change the logic of an underlying SQL query by injecting malicious SQL from the form fields of the front end of an application

9. User acceptance testing

- a. Black box testing of EA performed by End user
- b. Primarily from the perspective of system stated functionalities and usability
- c. Last stage of testing before rolling out and is required to clarify the readiness of EA

10. Up down Up rollout

- a. Starts with bringing down. The system is upgraded, verified and brought up again
- b. Most time consuming and requires a lot of upfront planning

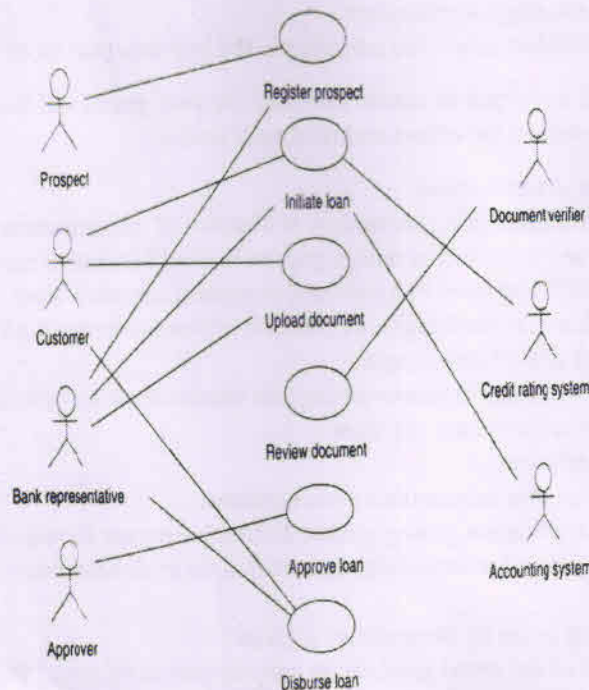
Part-B

11. A. (i). what are the skill required to developing a project?

- a. Knowledge of organizational dynamics
- b. Domain knowledge
- c. Business analysis skill
- d. Program Management skill
- e. Architecting and designing skills
- f. Programming skills
- g. Testing skill
- h. Knowledge of tools

-16 MARKS

B. (ii) use case diagram for initiate the loan



-8 MARKS

(ii) Various activities performed by business analyst during EA

- a. Identifies the business opportunities and business changes
- b. Identify the stock holder across business unit
- c. Collect and prioritizes the business requirement
- d. Define the business road map with scope and exclusions
- e. Determines the high level investment needed for the enterprise
- f. Conduct feasibility study for any changes proposed
- g. Conduct risk analysis and competitive analysis
- h. Decide on build or buy strategy
- i. Return on Investment business cases with proper justification
- j. Gets necessary approval from the sponsors

— 8 Marks

12. A (i). different types of relationship exist between classes

- a. Generalization relationship
- b. Extends relationship among use cases exist
- c. Uses relationship among use cases exists

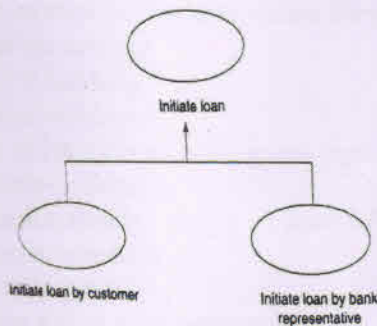


Figure 2-5 Generalization relationship among use cases.

— 3 Marks

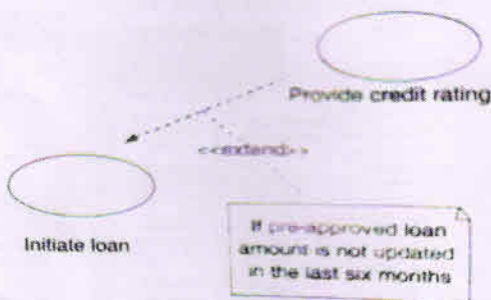


Figure 2-6 Extends relationship.

— 3 Marks

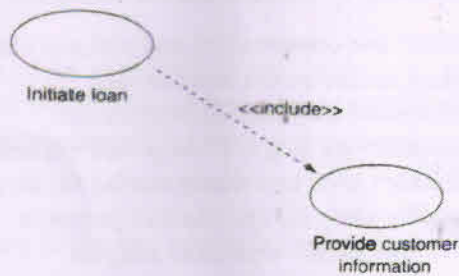


Figure 2-7 Uses/include relationship.

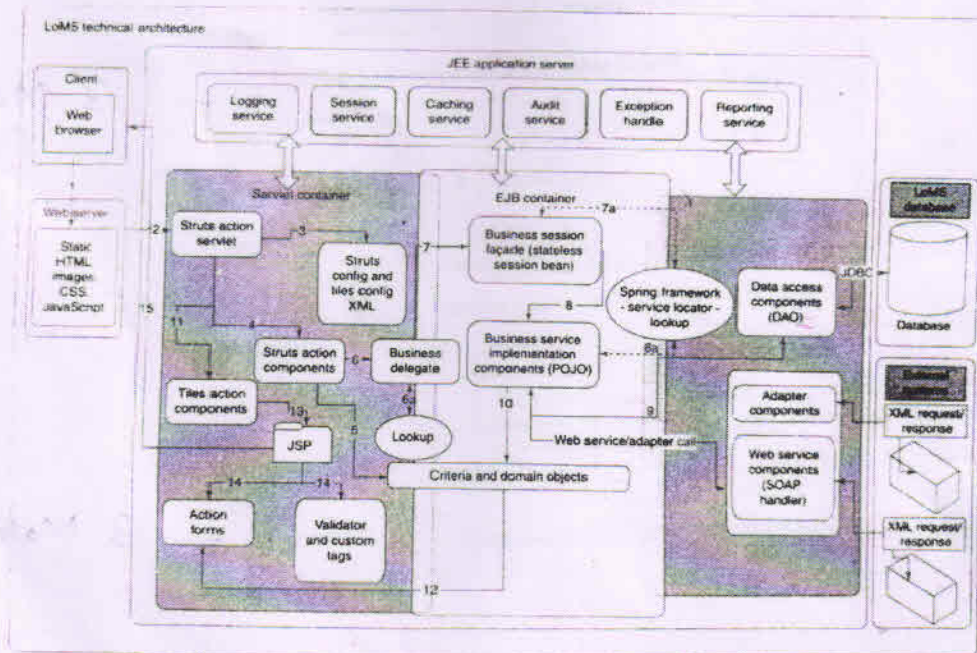
— 2 MARKS

A. (ii). Best practice used to design the technical layer of n-tire enterprise application.

1. Mapping logical architecture to technical architecture
2. Object oriented analysis and design
3. Infrastructure service layer
4. Presentation layer
5. Data layer
6. Business layer
7. Data access layer
8. Integration layer

2 Explain any one of the layers.
(16 MARKS)

B. Technical architecture for Bank



16 MARKS

13 A. (i). How do you document the result of the architecture?

a. System documentation

a. Key Element of SAD

- i. Goals of the architecture
- ii. Solution constraints
- iii. Logical architecture
- iv. Quality of services
- v. Integration requirement
- vi. Technology selection
- vii. Technical architecture
- viii. Data Architecture
- ix. Infrastructure Architecture

8 Marks

b. Design documentation

Key elements of presentation layer design documents

1. Screen mockup
2. Error handling
3. Input validation

Key elements of business and data access layer design document

1. Business delegate
2. Session façade
3. Business service
4. Business model
5. Data access layer component

A (ii). Building blocks of infrastructure Architecture

- a. Networking, internetworking and communication protocols
- b. IT hardware and software
- c. Middleware
- d. Policies for infrastructure management

- 4 Marks

+

Explanation

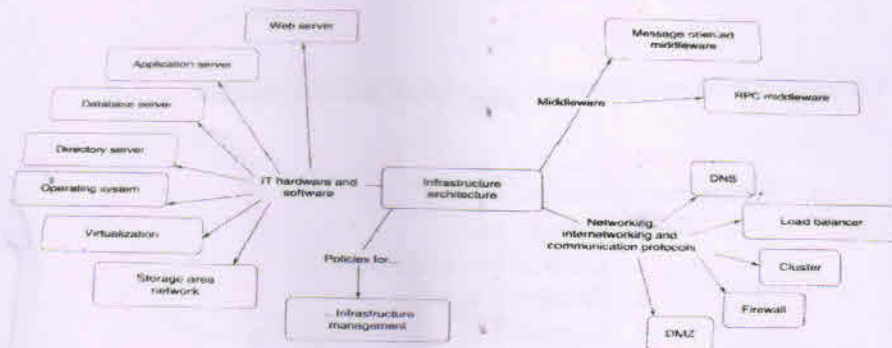
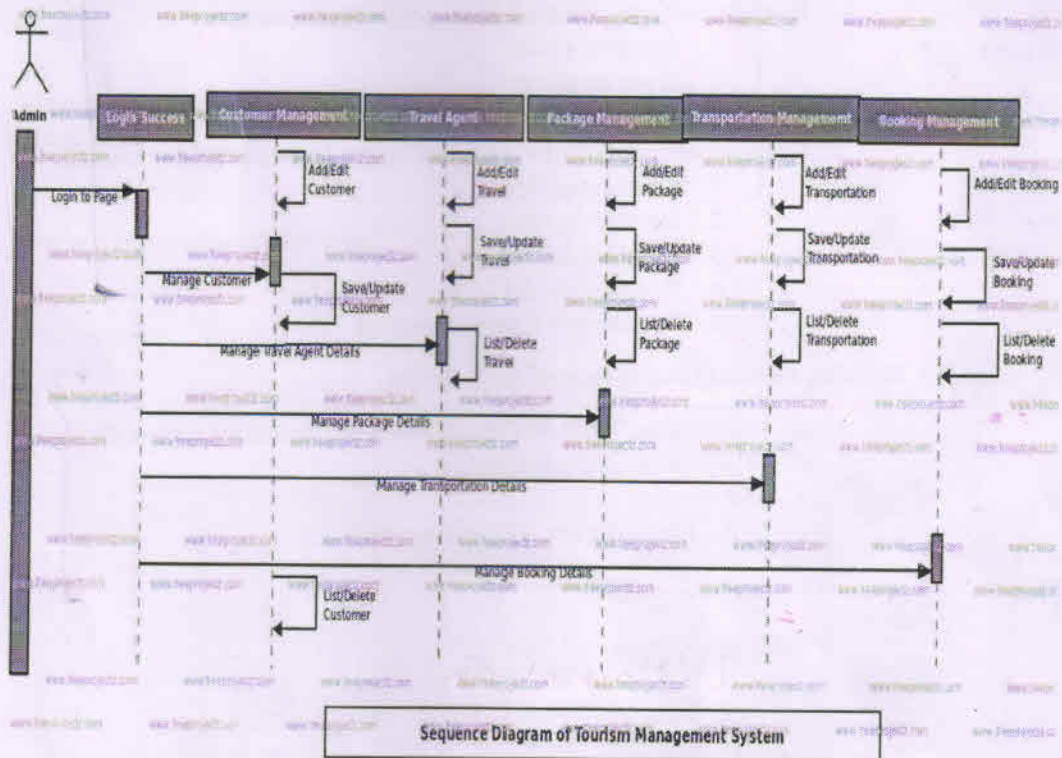


Figure 3-31 Infrastructure architecture building blocks.

2 Marks

B. (i). Tourism management system interaction between business delegate and business service



16 Marks

+

Explanation

14. A. (i). State the objective of static code analysis

Static code analysis is an activity of analysing the code, in source or byte code form.

To identify various issues related to non-run time aspect of the code.

- a. Code style
- b. Logical Bugs
- c. Security vulnerabilities
 - a. Cross site scripting
 - b. SQL injection
 - c. Improper session handling
- d. Code Quality

→ 2 marks

6 marks

A. (ii). How does Code profiling help in tuning the performance of the application

Code profiling

- Time consumed by methods
- Call sequence
- Thread deadlock information
- List of live threads and thread states
- Elapsed time

8 ~~6~~ marks

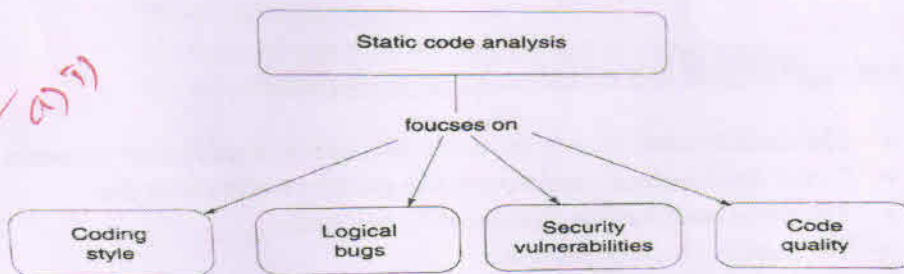


Figure 4-25 Static code analysis objectives.

(2 mark)

2 marks

B. (ii). Enumerate elements that are needed to setup the environment

- Hardware including operating system
- servers such as application, web, database, directory, and portal servers
- integrated development environment
- Third party libraries
- Build tools
- Unit testing tool
- Profiling tool
- Static code analysis tool
- License for all the required software

16 marks

15 (A) Demonstrate Globalization testing and user acceptance testing

Globalization testing

- Enterprise application are reaching out to user across the globe
- Globalization testing to validate whether an enterprise application meets the globalization requirements
- It also validates whether the application can be localized based on a given locale without any architectural change
- Globalization testing involves testing various things related to data and content of the enterprise application
- Language translation, writing direction, currency symbols, unit of measure date and time format, time zones, number formatting, font, sizes, colour, images, collation and ordering predominant things which are typically validated as part of this testing

4 Marks

User acceptance testing

- User acceptance testing is a black box testing of an enterprise application performed by the end users of the system, primarily from the perspective of system stated functionalities and usability.
- This is the last stage of testing before the application rollout, and is required to certify the readiness of EA to go live production
- The team to certify the acceptance of the EA typically represent a cross section of the end users of the application.

4 Marks

Objectives of a typical user acceptance testing are to validate:

- The stated functionalities in the system requirement specification document
- Part of non-functional requirements like usability and response time
- The access control of the modules of the application
- The complete business processes
- The business data from the outgoing and incoming interface
- The report format and contents.

15. (B). The exam registration process apply globalization testing and user acceptance testing

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