

MC100401285

CS504-Softwere Engineering -1 LATEST SOLVED SUBJECTIVES FROM MIDTERM PAPERS

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**Latest Subjective** 

## **CS504-MIDTERM SOLVED SUBJECTIVE WITH REFERENCES**



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# CS504 Subjective Midterm Examination 2011

#### Question No: 1 (Marks: 3)

Define Asynchronous Messages and Synchronous Messages.

#### Answer:- (Page 109)

#### Asynchronous Messages:-

Asynchronous messages are "signals," denoted by a half arrow. They do not block the caller. Asynchronous messages typically perform the following actions:

- Create a new thread
- Create a new object

Communicate with a thread that is already running

#### Synchronous Messages:-

Synchronous messages are "call events" and are denoted by the full arrow. They represent nested flow of control which is typically implemented as an operation call. In case of a synchronous message, the caller waits for the called routine to complete its operation before moving forward.

# Question No: 2 (Marks: 5) Law of balancing act in software

## Answer:- (Page 7)

#### **The Balancing Act!**

Software Engineering is actually the balancing act. You have to balance many things like cost, user friendliness, Efficiency, Reliability etc. You have to analyze which one is the more important feature for your software is it reliability, efficiency, user friendliness or something else. There is always a trade-off among all these requirements of software. It may be the case that if you try to make it more user-friendly then the efficiency may suffer. And if you try to make it more cost-effective then reliability may suffer. Therefore there is always a trade-off between these characteristics of software. These requirements may be conflicting. For example, there may be tension among the following:

following:

- Cost vs. Efficiency
- Cost vs. Reliability
- Efficiency vs. User-interface

A Software engineer is required to analyze these conflicting entities and tries to strike a balance.

# **Midterm Examination 2011**

# Question No: 3 (Marks: -- ) HOW DO YOU DETERMINE THAT AN OBJECTIVE BELONGS TO CERTAIN CLASS?

#### Answer:- (Page 85)

The basic unit of object oriented design is an object. An object can be defined as a tangible entity that exhibits some well defined behavior. The structure and behavior of similar objects are defined in their common class. A class specifies an interface and defines an implementation.

Question No: 4 ( Marks: -- ) What is meant by "System's Static View"?

#### Answer:- (Software engineering ---Page 608)

#### Static view of semantic classes.

Requirements are assessed and classes are extracted (and represented) as part of the analysis model. **Static view of attributes.** Every class must be explicitly described. The attributes associated with the class provide a description of the class.

#### Static view of relationships.

Objects are "connected" to one another in a variety of ways. The analysis model must represent these. **Static view of behaviors.** 

The relationships just noted define a set of behaviors that accommodate the usage scenario (use-cases) of the system

#### Question No: 5 (Marks: -- )

#### What is behavior driven perceptive of an objective?

#### Answer:- (Page 85)

Behavior is how an object acts and reacts in terms of its state changes and message passing. The behavior of an object is completely defined by its actions. A message is some action that one object performs upon another in order to elicit a reaction. The operations that clients may perform upon an object are called methods.

#### Question No: 6 ( Marks: -- ) What is Textual Analysis? Explain it

#### Answer:- (Page 90)

Textual analysis was developed by Abbot and then extended by Graham and others. In this technique different parts of speech are identified within the text of the specification and these parts are modeled using different components.

#### Question No: 7 (Marks: -- ) What is Software Architecture?

#### Answer:- (Page 116)

Architecture is the organizational structure of a system. Architecture can be recursively decomposed into parts that interact through interfaces, relationships that connect parts, and constraints for assembling parts. Parts that interact through interfaces include classes, components and subsystems.

# Question No: 8 ( Marks: -- )

What is the Cardinality of Objective?

Answer :- (Software engineering --- Page 334 )

**Cardinality.** The data model must be capable of representing the number of occurrences Objects in a given relationship. Tillmann [TIL93] defines the *cardinality* of an object/relationship pair in the following manner:

- One-to-one (1:1)—An occurrence of [object] 'A' can relate to one and only one occurrence of [object] 'B,' and an occurrence of 'B' can relate to only one occurrence of 'A.'
- One-to-many (1:N)—One occurrence of [object] 'A' can relate to one or many occurrences of [object] 'B,' but an occurrence of 'B' can relate to only one occurrence of 'A.' For example, a mother can have many children, but a child can have only one mother.
- Many-to-many (M:N)—An occurrence of [object] 'A' can relate to one or more occurrences of 'B,' while an occurrence of 'B' can relate to one or more occurrences of 'A.' For example, an uncle can have many nephews, while a nephew can have many uncles.

# **Midterm Examination 2011**

#### Question No: 9 (Marks: 2) Define abstraction?

## Answer:- (Page 79)

An abstraction is a technique in which we construct a model of an entity based upon its essential characteristics and ignore the inessential details.

#### Question No: 10 (Marks: 2)

#### Is the design of software architecture a creative process?

#### Answer:- (Page 120)

Design of software architecture is a creative and iterative process. This involves performing a number of activities, not necessarily in any particular order or sequence.

#### Question No: 11 (Marks: 2)

Suppose you are working as a software engineer involved in the development of an e-commerce website. What are the 2 most important characteristics your software must have?

#### Answer:- (Software engineering ---Page 797)

Two most important characteristics are that software should be reliable and useable.

#### Question No: 12 (Marks: 3)

## What is the purpose of collaboration diagrams?

Answer:- (Page 111)

Collaboration diagrams can also be used to depict the dynamic behavior of a system. They show how objects interact with respect to organizational units (boundaries!). Collaboration diagrams can also show synchronous, asynchronous, create, and destroy message using the same notation as used in sequence diagrams.

## Question No: 13 (Marks: 3) What is the difference between Aggregation and Association?

#### Answer:- (Page 87)

As compared to association, aggregation implies a tighter coupling between the two objects which are involved in this relationship. Therefore, one way to differentiate between aggregation and association is that if the two objects are tightly coupled, that is, if they cannot exist independently, it is an aggregation, and if they are usually considered as independent, it is an association.

#### Question No: 14 (Marks: 5)

#### what parameters are used to measure and analyze design quality?

Answer:- (Page 71)

A software design can be looked at from different angles and different parameters can be used to measure and analyze its quality. These parameters include efficiency, compactness, reusability, and maintainability. A good design from one angle may not seem to be suitable when looked from a different perspective. For example, a design that yields efficient and compact code may not be very easy to maintain. In order to establish whether a particular design is good or not, we therefore have to look at the project and application requirements.

# **Midterm Examination 2011**

#### Question No: 15 (Marks: 5)

#### Discuss some of the purpose of interacting diagram?

Answer:- Click here for detail

The purposes of interaction diagrams are to visualize the interactive behaviour of the system. Now visualizing interaction is a difficult task. So the solution is to use different types of models to capture the different aspects of the interaction.

That is why sequence and collaboration diagrams are used to capture dynamic nature but from a different angle.

So the purposes of interaction diagram can be describes as:

- ✤ To capture dynamic behaviour of a system.
- ✤ To describe the message flow in the system.
- To describe structural organization of the objects.
- To describe interaction among objects.

#### Question No: 16 (Marks: 5)

#### What should be consideration for maintain design?

#### Answer:- (Page 71)

In order to make a design that is maintainable, it should be understandable and the changes should be local in effect. That is, it should be such that a change in some part of the system should not affect other parts of the system. This is achieved by applying the principles of modularity, abstraction, and separation of concern. If applied properly, these principles yield a design that is said to be more cohesive and loosely coupled and thus is easy to maintain.

Question No: 17 (Marks: 3) Purpose of collaborating diagram? Answer:- (repeated)

#### Question No: 18 (Marks: 3)

It is fact that good design makes maintenance easier. Which design principle help this to be achieved? Answer:- (Page 71)

A good design from one angle may not seem to be suitable when looked from a different perspective. For example, a design that

yields efficient and compact code may not be very easy to maintain. In order to establish whether a particular design is good or not, we therefore have to look at the project and application requirements.

# **Midterm Examination 2011**

#### Question No: 20 (Marks: -- )

To manage the complexity of the system we need to apply the principle of abstraction. Discuss briefly? Answer:- (Page 79)

An abstraction is a technique in which we construct a model of an entity based upon its essential characteristics and ignore the inessential details. The principle of abstraction also helps us in handling the inherent complexity of a system by allowing us to look at its important external characteristic, at the same time, hiding its inner complexity. Hiding the internal details is called encapsulation.

#### Question No: 21 (Marks: 2)

#### Differentiate between architectural design and system architecture in a single line?

#### Answer:- Click here for detail

Architecture faces towards strategy, structure and purpose, towards the abstract while Design faces towards implementation and practice, towards the concrete.

#### Question No: 5 (Marks: 3)

#### What are architectural designs Process, explain briefly?

Answer:- (Page 79)

#### System structuring: -

System structuring is concerned with decomposing the system into interacting sub-systems. The system is decomposed into several principal sub-systems and communications between these sub-systems are identified.

#### **Control modeling:-**

Control modeling establishes a model of the control relationships between the different parts of the system.

#### Modular decomposition:-

During this activity, the identified sub-systems are decomposed into modules. This design process is further elaborated in the following section where architectural views are discussed.

#### **Question No: 5 (Marks: 5)**

What should be the consideration for maintainable design? Answer:- (rep)

#### Question No: 5 (Marks: 5)

Discuss the relationship between sequence diagram and logical complexity?

#### Answer:- (Page 110)

It is important to understand that the diagrams are meant to make things clear. Therefore, in order to keep them simple, special attentions should be paid to the conditional logic. If it is simple then there is no harm in adding it to the diagram. On the other hand if the logic is complex then we should draw separate diagrams like flow charts.

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Question No: 17 (Marks: 2) To manage the complexity of the system we need to apply the principles of abstraction. Discuss briefly. Answer: rep

#### Question No: 18 (Marks: 2) p2chapter 5 Define Motivation of GUI Answer:

#### **Motivation for GUI**

- System users often judge a system by its interface rather than its functionality
- ✤ A poorly designed interface can cause a user to make catastrophic errors
- ✤ Poor user interface design is the reason why so many software systems are never used

#### Question No: 19 (Marks: 2) Is the design of software architecture a creative process? Answer: rep

#### Question No: 20 (Marks: 3) Keeping in mind the Connie's case study, what rule of thumbs was identified, list them down. Answer:- (Page 101)

Who I Know - Rules of Thumb

- ✤ an actor knows about its participants person knows about cashier
- \* a transaction knows about its participants a session knows about its register and cashier
- \* A transaction contains its transaction line items sale contains its sales line items
- \* A transaction knows its sub transactions session knows about its sales sale knows about its payments
- \* A place knows about its transactions store knows about its sessions
- \* A place knows about its descriptive objects store knows about its tax categories
- \* A container knows about its contents a store knows about its cashiers, items, and registers

#### Question No: 21 (Marks: 3)

The CPU of a computer consists of an ALU and a CU. Intel and AMD are two types of CPUs, which are widely used in computers. Users of computers can be either novices or experts. Consider the following classes.

# (i) CPU and AMD(ii) User and Computer(iii) CPU and ALU

#### **Answer:**

**CPU and AMD:** There is relationship between CPU and AMD is "A kind of" type as AMD is a kind of CPU.

#### **User and Computer:-**

The relationship between User and Computer is "simple Association" type as there is weak relationship between user and computer.

**CPU and ALU:-**Relationship between CPU and ALU is "composition" type as ALU is a part of CPU.

Question No: 22 (Marks: 5) What is action-oriented approach for Software Design?

#### Answer: (Page 80)

In the case of action-oriented approach, data is decomposed according to functionality requirements. That is, decomposition revolves around function. In the OO approach, decomposition of a problem revolves around data. Action-oriented paradigm focuses only on the functionality of a system and typically ignores the data until it is required. Object- oriented paradigm focuses both on the functionality and the data at the same time. The basic difference between these two is decentralized control mechanism versus centralized control mechanism respectively. Decentralization gives OO the ability to handle essential complexity better than action-oriented approach.

#### Question No: 23 (Marks: 5) Collaboration Diagrams depict Dynamic behavior of the system, explain it.

#### Collaboration diagrams:- Answer: (Page 110)

Collaboration diagrams can also be used to depict the dynamic behavior of a system. They show how objects interact with respect to organizational units (boundaries!).

Since a boundary shapes communication between system and outside world e.g. user interface or other system, collaboration diagrams can be used to show this aspect of the system. The sequence of messages determined by numbering such as 1, 2, 3, 4, This shows which operation calls which other operation.

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Question No: 17 (Marks: 2) To manage the complexity of the system we need to apply the principles of separation of concern. Discuss briefly Answer: (Page 69)

Separation of concern allows us to deal with different individual aspects of a problem by considering these aspects in isolation and independent of each other. A complex system may be divided into smaller pieces of lesser complexity called modules.

#### Question No: 18 (Marks: 2) What is elaborated Use case? Explain it Answer: (Page 36)

After the derivation of the use case model, each use is elaborated by adding detail of interaction between the user and the software system. An elaborated use case has the following components: Use Case Name, actors, summary, precondition, post-condition, extend, uses, normal course of events, alternative path, exception, assumption.

Question No: 19 (Marks: 2) What is Software Architecture? Answer: rep

Question No: 20 (Marks: 3) What notation is used for Sequence Diagrams? Draw it graphically. Answer: (Page 106)

The Notation

Following diagram illustrates the notation used for drawing sequence diagrams.



#### Question No: 21 (Marks: 3) How can we decrease Coupling explain it.

Answer: (Page 113)

That is, we can reduce the coupling of a system by minimizing the number of messages in the protocol of a class.

#### Question No: 22 (Marks: 5)

Narrate some of the architectural design guidelines that can help in addressing non-functional requirements challenges.

#### Answer: (Page 120)

Software architecture must address the non-functional as well as the functional requirements of the software system. Following are some of the architectural design.

Performance –Performance can be enhanced by localizing operations to minimize sub-system communication.

That is, try to have self-contained modules as much as possible so that inter-module communication is minimized.

**Security** –Security can be improved by using a layered architecture with critical assets put in inner layers. **Safety** –Safety-critical components should be isolated

Availability –Availability can be ensured by building redundancy in the system and having redundant components in the architecture.

**Maintainability**–Maintainability is directly related with simplicity. Therefore, maintainability can be increased by using fine-grain, self-contained components.

#### Question No: 23 (Marks: 5)

#### What is the importance of Classification in identifying Classes and objects?

#### Answer: (Page 763)

Consider a large university library. Tens of thousands of books, periodicals, and other information resources are available for use. But to access these resources, a categorization scheme must be developed. To navigate this large volume of information, librarians have defined a classification scheme that includes a Library of Congress classification code, keywords, author names, and other index entries. All enable the user to find the needed resource quickly and easily.

Question No: 17 (Marks: 2) Define abstraction Answer: rep

Question No: 18 (Marks: 2) What is Software Architecture? Answer: rep

Question No: 19 (Marks: 2) Suppose you are working as a software engineer involved in the development of an e-commerce website. What are the 2 most important characteristics your software must have? Answer: rep

Question No: 20 (Marks: 3) What is the purpose of collaboration diagrams? Answer: rep

Question No: 21 (Marks: 3) It is a fact that a good design makes maintenance easier. List a design principle which helps this to be achieved. Answer: rep

Question No: 22 (Marks: 5) Discuss the relationship between Sequence diagrams and logical complexity Answer: rep

#### Question No: 23 (Marks: 5) What is the difference between Association and composition? Answer:- (OOP, PAGE 51-52)

In Association, interacting objects have no intrinsic relationship with other object. It is the weakest link between objects. While in Composition An object may be composed of other smaller objects, the relationship between the "part" objects and the "whole".

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#### Question No: 23 (Marks: 3) How can we decrease coupling? Explain it. Answer: rep

Question No: 23 (Marks: 5) What is meant by "system's static View"? Discuss briefly. Answer: rep

#### Question No: 23 (Marks: 5)

#### How the objects are identified in peter codd's technique?

#### Answer: (Page 93)

Objects are identifying in the following way.

#### **Select actors**

Actors are people and organizations that take part in the system under consideration.Examples of actors are: person, organization (agency, company, corporation, foundation).

#### **Select Participants**

A participant is a role that each actor plays in the system under consideration. Examples of participants are: agent, applicant, buyer, cashier, clerk, customer, dealer, and distributor. Etc.

#### **Select Places**

Places are where things come to rest or places that contain other objects. Examples of places are: airport, assembly-line, bank, city, clinic, country, depot, garage and hospital etc.

#### **Select Transactions**

Transactions are the "events". These transactions usually come from a window (GUI), some object which monitors for significant event and logs that information, or a another system that interacts with the system under consideration and logs some information. Examples of transactions are: agreement, assignment, authorization, contract, delivery, deposit, incident, inquiry, order, payment, problem report, purchase and sales etc.

#### **Select Container Objects**

Containers are objects that hold other objects. e.g. bin, box, cabinet, folder, locker, safe, shelf, etc. Therefore a place is also a container but every container need not be a place.

#### **Select Tangible things**

Take a "walk" through the system and select "tangible" things around you used in the problem domain. These may be characterized as all the remaining (not yet selected) "nouns" that make up the problem domain. Examples are: account, book, calendar, cash box, cash drawer, item, plan, procedure, product, schedule, skill, tool, etc

Question No: 23 (Marks: 3) What is the purpose of interaction diagram? Answer: rep

Question No: 23 (Marks: 2)

#### **Define cohesion.**

#### Answer: (Page 72)

Cohesion is an internal property of a module. Cohesion describes the intra-component linkages while couple shows the inter-component linkages. Cohesion measures the independence of a module.

#### Question No: 23 (Marks: 2)

Keeping connie's case study in mind, as discussed in lecture, list down whole parts structures which were identified.

#### Answer: (Page 100)

**Identify Whole-Part Structures** 

- ✤ A store as a whole is made up of cashiers, registers, and items.
- ✤ A register contains a cash drawer.
- ✤ A sale is constituted of sale line items.

#### Question No: 23 (Marks: -- )

Define data flow diagram

#### Answer: (Page 100)

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modeling its process aspects. Often they are a preliminary step used to create an overview of the system which can later be elaborated.

# **MIDTERM EXAMINATION - Spring 2010**

Question No: 17 (Marks: 2) Define abstraction? Answer: rep

Question No: 18 (Marks: 2) Is the design of software architecture a creative process? Answer: rep

Question No: 19 (Marks: 2) Suppose you are working as a software engineer involved in the development of an e-commerce website. What are the 2 most important characteristics your software must have? Answer: rep

Question No: 20 (Marks: 3) What is the purpose of collaboration diagrams? Repeated Answer: rep

Question No: 21 (Marks: 3) What is the difference between Aggregation and Association? P5 chapter 7 Answer: rep

Question No: 22 (Marks: 5) What parameters are used to measure and analyze design quality? Answer: rep

Question No: 23 (Marks: 5) How the objects are identified in Peter codd's technique? Repeated Answer: rep

Question No: 24 (Marks: 5)

#### comparison of software architecture and Building architecture

#### Answer: (Page 115)

When building a house, the architect, the general contractor, the electrician, the plumber, the interior designer, and the landscaper all have different views of the structure. Although these views are pictured differently, all are inherently related: together, they describe the building's architecture. The same is true with software architecture. Architectural design basically establishes the overall structure of a software system.

```
Question No: 25 (Marks: 10)
Code example of High Coupling
Answer:
            Click here for detail
Tightly Coupled Example:
public class CartEntry
    public float Price;
    public int Quantity;
public class CartContents
   public CartEntry[] items;
}
public class Order
    private CartContents cart;
    private float salesTax;
    public Order(CartContents cart, float salesTax)
        this.cart = cart;
```

```
this.salesTax = salesTax;
}
public float OrderTotal()
{
    float cartTotal = 0;
    for (int i = 0; i < cart.items.Length; i++)
    {
        cartTotal += cart.items[i].Price * cart.items[i].Quantity;
    }
        cartTotal += cartTotal*salesTax;
    return cartTotal;
}</pre>
```

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#### Question No: 16 (Marks: 2)

Adding user interface detail in the SRS is controversial a creative process i.e by adding GUI detail to the SRS document, focus e shift from what to how (analysis design) do you agree ?

#### Answer: (Page 115)

}

Yes I am agree because Client appreciates more the contents of the SRS document if our SRS document contains the GUI details than if we don't have them there.

Question No: 17 (Marks: 2) Is the design software of architecture a creative process? Answer: rep

Question No: 18 (Marks: 3) What is the architecture design process explain briefly. Answer: rep

Question No: 19 (Marks: 3) What is textual analysis? Answer: rep

Question No: 20 (Marks: 5) What should be the consideration for the maintainable design? Answer: rep

Question No: 21 (Marks: 5) Discuses the relation between sequence diagram & logical complexity. Answer: rep