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**Online Mid – Term Examination**

**Q.1: What are the four important attributes that all professional software should have? Suggest four other attributes that may sometimes be significant.**

**Answer 1:**

**Four important attributes of professional software are:**

1. Maintainability
2. Dependability and security
3. Efficiency
4. Acceptability/Usability

## **Other attributes that are also significant are:**

1. Response time (non-functional attribute)
2. Interactivity
3. Reliable
4. Evolution

## **Q.2: Explain why professional software is not just the programs that are developed for a customer.**

**Professional software** is not just the programs that are developed for a customer but it consist of executable code and is associated with documentation and configuration of data that is required to make these programs operate correctly .A professionally developed software system is often more than a single program. The system usually consists of a number of separate programs and configuration files that are used to set up these programs. It may include system documentation, which describes the structure of the system; user documentation, which explains how to use the system, and web sites for users to download recent product information. Example a word processing system consist of executable program, user manual and the document such as requirements and the design needed to

produce the executable program.

**Q.3: Giving reasons for your answer based on the type of system being developed, suggest the most appropriate generic software process model that might be used as a basis for managing the development of the following systems:**

- **A system to control anti-lock braking in a car**
- **A virtual reality system to support software maintenance**
- **A university accounting system that replaces an existing system**
- **An interactive travel planning system that helps users plan journeys with the lowest environmental impact**

**Answer(3):**

### **1. Anti-Lock Braking System:**

This is a safety-critical system so it requires a lot of up-front analysis before implementation. It certainly needs a plan-driven approach to development with the requirements carefully analysed. A waterfall model is

therefore the most appropriate approach to use, perhaps with formal transformations between the different development stages.

## **2. Virtual Reality System:**

This is a system where the requirements will change and there will be an extensive user interface components. Incremental development with, perhaps, some UI prototyping is the most appropriate model. An agile process may be used.

## **3. University Accounting System:**

This is a system whose requirements are fairly well-known and which will be used in an environment in conjunction with lots of other systems such as a research grant management system. Therefore, a reuse-based approach is likely to be appropriate for this.

## **4. Interactive Travel Planning System:**

This is a system with a complex user interface. An incremental development approach is the most

appropriate as the system requirements will change as real user experience with the system is gained.

**Q.4: Explain why incremental development is the most effective approach for developing business software systems. Why is this model less appropriate for real-time systems engineering?**

**Answer(4):**

**Incremental model is the most effective model in designing a software system. Below are the reasons justifying it.**

- The software system will be delivered quickly to the user.
- The cost for each iteration is very less.
- The testing efforts for each iteration will be less because only few additional functions need to be added in each iteration.
- The final product produced will be perfect without any defects or issues since we get feedback of the customer during each iteration and developers will resolve these defects/issues.
- This model allows user to modify/change the requirements according to his convenience at any

phase of iteration.

**This model is less appropriate to the real-time systems. The following are the reasons justifying it.**

- The overall cost will be more compared to the waterfall model.
- Same resources may not be available for the next iterations. Hence, new resources should be trained again for working on the application.
- Concerns regarding the system architecture may arise as all the requirements are not gathered for the software lifecycle at the initial phase.

**Q.5: Suggest why it is important to make a distinction between developing the user requirements and developing system requirements in the requirements engineering process.**

**Answer(5):**

There is a fundamental difference between the user and the system requirements that mean they should be considered separately.

a) **The user requirements** are intended to describe the system's functions and features from a user perspective and it is essential that users understand these requirements. They should be expressed in natural language and may not be expressed in great detail, to allow some implementation flexibility. The people involved in the process must be able to understand the user's environment and application domain.

b) **The system requirements** are much more detailed than the user requirements and are intended to be a precise specification of the system that may be part of a system contract. They may also be used in situations where development is outsourced and the development team need a complete specification of what should be developed. The system requirements are developed after user requirements have been established.

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