

SD2799 Software Development Capstone Project Final Exam

FINAL EXAM QUESTIONS

1. Define the following concepts:

- Data redundancy
- First normal form
- Second normal form
- Third normal form

Explain the above concepts using the following terms:

- Primary keys
- Candidate keys
- Functional dependencies
- Transitive dependencies

Provide an illustrative example of each.

[illegible]

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2. Define public, protected, and private inheritance. Provide examples of software objects you have used in your own program code and how the use of these objects helped promote code reuse.

3. Define the term “Activity” and explain its purpose.

[illegible]

4. Define and contrast the following terms:

- Control structure
- Sequence
- Multiple-alternative decision structure
- Counter-controlled loops
- Conditional loops

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5. Explain how data is added and removed from a list fragment.

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6. What are the stages of the Software Development Lifecycle (SDLC)? Define each stage.

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7. What is software versioning and how is it used in software development?

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8. Describe how programs of the following types get executed: low-level, high-level compiled, and high-level interpreted.

9. How are the concepts of data redundancy, data accuracy, and normalization related? What implications do these concepts have on database design?

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10. What are the significant differences and similarities among high-level compiled, high-level interpreted, and low-level programs?

[illegible]

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11. What are the strengths and weaknesses of using the following approaches to software development?

- Waterfall
- Incremental Development
- Rapid Application Development

Under what circumstances would each approach prove more effective?

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12. Compare and contrast public inheritance, protected inheritance, and private inheritance. Under what conditions would you use one over the other?

13. Why is software development generally perceived to be a cyclical process requiring incremental development, testing, and user approval versus writing most software applications in just one pass?

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14. Explain how Remote Method Invocation (RMI) works and how it differs from Remote Procedure Calls (RPCs). Are there any benefits of using one method over the other?

[illegible]

[illegible]

15. You have been contracted to revise and enhance the performance of a company's Web-based application. The application consists of a traditional client/server application. The response time of the application is somewhat slow, and your task is to speed it up. What design changes could you make to the application?

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16. A junior programmer in your department comes to you with a problem with a Java applet he has been designing to transfer files from a client's machine to some other machine and vice versa. The file data copies from the client's machine successfully, but it does not get written to the client user's machine. What is the problem?

17. Your company's software design team is looking to revise a program that conducts data backups. Currently, the data to be backed up is stored in an array format, but it seems to waste a lot of space when data is deleted. Because of limited disk space, implementing a database solution would not be feasible. What alternatives can you suggest?

18. You work at a large, federally insured financial institution where the bulk of the software runs on a mainframe in a batch fashion, with nightly updates. Complying with federal regulations is of paramount importance and the IT department is regularly audited to ensure compliance. The software application used has not fundamentally changed in the last 15 years, and most software development activity concerns minor changes to reports run off the database. The IT director wants to implement eXtreme Programming principles for software development, as opposed to the traditional Waterfall techniques currently used, and has asked for your advice/opinion on the issue. What do you say?

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19. You have been tasked to write a utility class to perform a critical safety check for a unique hydraulic press. What measures can you take in the design of your class to ensure that no programmers in the future make derivative classes from your utility class, which could lead to the unintentional misapplication of your original code?

[illegible]

20. The president of your company believes that if it is written correctly, software does not need to be tested or reviewed. Consequently, no testing of the company's software is done before it is released into production. Now, he finds the software constantly needs to be revised. Either the applications created are not what users want or they do not behave as desired. The software development team is obviously not doing its job. The president has asked for your input to get the software team back on track. What will you recommend to the president?

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(End of Quizzes and Exams)