Tutorial -1

1. Software is the differentiating characteristics in many computer based products and systems. Provide examples of two or three products and at least one system.

2. Provide five examples of software development projects that would be amenable to prototyping. Name two or three applications that would be more difficult to prototype.

3. Provide three examples of fourth generation techniques.

4. Describe three situations in which the customer and the end user are one and the same. Describe three in which they are the different people.

Tutorial -2

5. You have been appointed a project manager for a major software product company. Your job is to manage the development of a next generation version of its widely used word processor software product. Because competition in intense, tight deadlines has been established and announced. What team structure would you choose and why? What software process models would you choose and why?

6. Compute the function point value for a project with the following information domain characteristics

   Number of user inputs: 32

   Number of user outputs: 60

   Number of user inquiries: 24

   Number of files: 8

   Number of external interfaces: 2

   Assume that all complexity adjustment values are average. Assume that 14 algorithms have been counted. Compute the feature point value under the same conditions.

7. Team A found 342 errors during the software engineering process prior to release.

   Team B found 184 errors. What additional measures would have to be made for projects A and B to determine which of the teams eliminated errors more efficiently? What metrics would you propose to help make the determination? What historical data might be useful?

Tutorial-3

8. Assume that you are a project manager for a company that builds software for consumer products. You have been contracted to build the software for a home security system. Write a statement of scope that describes the software.

   9. Do a functional decomposition of the home security system software. Estimate the size of each function in LOC assuming that your organization produces 450 LOC/pm with a burdened labor rate of $ 7000 per person month. Estimate the effort and cost required to build the software using the LOC based estimation technique.

10. Describe five software application areas in which software safety and hazard Analysis would be a major concern.

Tutorial-4

11. You have been asked to build software to support a low cost video editing system. The system accepts videotape as input, stores the video on disk, and then allows the user to do a wide range of edits to the digitized video. The result can then be output to tape. Do a small amount of research on systems of this type, and then make a list of technology risks that you would face as you begin a project to build the video editing system.

12. Describe the difference between risk components and risk drivers.

13. You are the project manager of a major software company. You have been asked to lead a team that is developing next generation word processing software. Create a risk table for the project.

14. Can you think of a situation where high impact, high probability risk would not be considered as part of your RMMM plan?

Tutorial-5

15. What is the difference between a macroscopic schedule and a detailed schedule? Is it possible to manage a project if only a macroscopic schedule is developed? Why?

16. Although adding people late in the software project can make it later, there are circumstances in which this is not true. Describe them.

17. Suggest practical methods that would enable a manager to monitor compliance with costs and schedules defined in the software project plan.

18. Why is there often a tension between a software engineering group and independent software quality assurance group?

Tutorial-6

19. You have been given the responsibility for improving the quality of software across your organization. What is the first thing that you would do? What is next?

20. What is the difference between an SCM audit and a formal technical review? Can their function be folded into one review? What are the pros and cons?

21. Suppose you are involved in an office automation project in the printing industry. The system to be developed is meant to support the work of journal editors. The management objective for this objective is to save labor cost. The editors' objective is to increase the quality of their work. Discuss possible ramifications of these opposing objectives on this project.

Tutorial-7

22. Do you think quantitative project data are important? In what way can they contribute to project planning?

23. A program written for personnel use imposes rather less stringent requirements then a product that is also to be used by other people. The latter may require three times as much effort. Discuss.

24. Suppose you are involved in a large project concerning the development of a patient planning system for a hospital. You may opt for one of the two strategies. The first strategy is to start with a thorough analysis of user requirements, after which the system is built according to these requirements. The second strategy starts with a less complete requirements analysis phase, after which a pilot version is developed. This pilot version is installed in a few small departments. Further developments of the system are guided by the experience gained in working with the pilot version. Discuss the pros and cons of both strategies. Which you will favor.

Tutorial-8

25. Discuss possible differences between configuration management in a traditional waterfall development model and the evolutionary development models.

26. Devise a configuration management scheme for a small project 7 a large project. Give a rationale for differences.

27. Discuss differences and similarities between configuration management during development and maintenance.

Tutorial-9

28. From a management point of view discuss possible pros and cons of having a technical wizard on your development team.

29. Discuss the pros and cons of letting people rotate between projects from different application domains as opposed to letting them become true experts in one particular application domain.

30. Why should the software quality assurance organization be independent of the development organization?

31. How early cost estimates influences the way in which your project is executed?

Tutorial-10

32. Why should software cost models be recalibrated from time to time?

33. Suppose you are managing a project that is getting behind schedule. Possible actions include renegotiating the time schedule, adding people to the project, Renegotiating quality requirements. In which ways can these actions shorten the time schedule? Can you think of other ways to finish the project on time?

34. Suppose you have a LOC based cost estimation model available whose parameters are based on projects from your own organization that used COBOL as the implementation language. Can you use this model to estimate the cost of a project whose implementation language is Pascal? What if a model is based on the projects that used C?

Tutorial-11

35. Suppose one of the team members is dissatisfied with his situation. He has been involved in similar projects for several years now. You have assigned him these jobs because he was performing well. Discus possible actions to prevent this employee from leaving the organization.

36. Suppose you are a manager of a project that is getting seriously behind schedule. Your team is having severe problems with testing a particular subsystem. Your client is pressing you to deliver the system on time. How would you handle this situation? How would you handle this situation if you were a member of the team and your manager was not paying serious attention to your signals?

37. For an office automation system identify different types of stakeholders. Can you think of the conflict in requirements of these stakeholders?

38. What is the difference between software architecture and top-level design?

Tutorial-12

39. Why is language so important in software design?

40. What is functional decomposition?

41. What is the difference between problem oriented and product oriented design methods?

42. Discover ambiguities or omissions in the following statement of requirements for a ticket issuing system an automated ticket issuing system sells rail tickets. Users select their destination and input a credit card and a personal identification number. The rail ticket is issued and their credit card account charged with its cost. When the user presses the start button, a menu display of potential destinations is activated along with a message to the user to select a destination. Once a destination has been selected users are requested to input their credit card. Its validity is checked and the user is then requested to input a personal identification number. When the credit transaction has been validated the ticket is issued.

Tutorial-13

43. What are the requirements of a programming language so that it is suitable for defining interface specification? Comment on the suitability of c, c++ and Java for this purpose.

44. Discuss an example of a type of system where social and political factors might strongly influence the system requirements. Explain why these factors are important in your example.

45. When emergency changes have to be made to the system, the system software has to be modified before changes to the requirements have been approved. Suggest the model of a process for making these modifications, which ensures that the requirements document and the system implementation do not become inconsistent.

Tutorial-14

46. Describe three modeling activities that may be supported by case tools for some analysis method. Suggest three activities that cannot readily be automated.

47. Suggest difficulties that might arise when prototyping real time embedded computer systems.

48. You have developed a throwaway prototype system for a client who is very happy with it. However she suggests that there is no need to develop another system but that you should deliver the prototype and offers an excellent price for the system. You know that there may be future problems with maintaining the system. Discuss how you will respond.

Tutorial-15

49. Suggest why the architectural design of a system should precede the development of a formal specification.

50. You have been given the task of selling formal specification techniques to a software development organization. How you can explain the advantages of a formal specification model.

51. Explain why it may be necessary to design the system architecture before the specifications are written.

52. You are given the two integrated case tools and are asked to compare them. On what basis will you make the comparison?

53. What is the difference between a macroscopic schedule and a detailed schedule? Is it possible to manage a project if only a macroscopic schedule is developed? Why?

Tutorial-16

54. Quality and reliability are related concepts, but are fundamentally different in many ways. Discuss. Can a program be correct and still not be reliable. Can a program be correct and still not exhibit good quality.

55. Discuss the reason for a baseline. Assume that you are a manager of a small project. What baselines will you define and how will you control them?

56. Software requirement analysis is unquestionably the most communication intensive step in the software engineering process. Why does the communication path frequently break down?

57. There are frequent severe political repercussions when software requirement analysis begins. Give the reasons. Can the analyst task be conducted so that politics is minimized? Discuss the ideal skills for a system analyst.

Tutorial-17

58. Discuss the difference between cardinality and modality between objects.

59. Describe the concept of information hiding, abstraction, polymorphism and inheritance with examples.

60. How we select macroscopic and microscopic styles and patterns for software work. Match your criteria with some other set of problems.