CS6403 - SOFTWARE ENGINEERING

QUESTION BANK

UNIT I - SOFTWARE PRODUCT AND PROCESS

Part - A (2 MARKS)

1. What is the prime objective of software engineering?
2. Define software engineering paradigm.
3. What do you mean by spiral model?
4. Write a brief note on waterfall model.
5. Distinguish between process and methods.
6. Give the importance of software engineering.
7. Define software process. State the important features of a process.
8. Write any two characteristics of software as a product.
9. List the process maturity levels in SEI’s CMM.
10. Distinguish clearly between verification & validation.
11. What are the functions of data architecture?
13. State the System Engineering Hierarchy.
14. Mention some of the factors to be considered during System Modeling.
15. What are the different architectures developed during BPE?
16. Define Verification & Validation.

PART – B

1. Explain iterative waterfall and spiral model for software life cycle and discuss various activities in each phase. (16)
2. List several software process paradigms. Explain how both waterfall model and prototyping model can be accommodated in the spiral process model. (16)
3. Explain in detail Boehm's spiral model for software life cycle and discuss various activities in each phase. (16)
4. a) Which is more important-the product or process? Justify your answer. (4)
b) Identify the umbrella activities in software engineering process. (4)
c) With suitable illustration explain SPIRAL model evolutionary software development. (8)

UNIT II - SOFTWARE REQUIREMENTS

PART A (2 MARKS)

1. Mention any two non-functional requirements on software to be developed
2. What is known as SRS review? How is it conducted?
3. Distinguish between expected requirements and excited requirements
4. What is meant by software prototyping?
5. What are the non-functional requirements of software?
6. What is data dictionary? How is it used in software engineering?
7. Write the distinct steps in requirements engineering process?
8. Compare evolutionary and throw away prototyping?
9. What is the role of data dictionary?
10. Write a brief note on data modeling activity?
11. What is meant by Information flow Continuity?
12. Draw a DFD & CFD of a test monitoring system for Gas Turbine
15. What is meant by Data dictionary?
17. What does data dictionary contains?
18. Write down the Data dictionary for the data item “Telephone
19. What is meant by Throw away Prototyping?

**PART B**

1) Explain the ways and means for collecting the software requirements and how are they organized and represented? (16)
2) Describe various prototyping techniques and discuss on analysis sand modeling.(16)
3) a) Discuss in detail the data modeling activity (8)
   b) Write briefly about the utility of state transition diagram in analysis modeling activity (8)
4) a) Compare functional and behavioral models. (4)
   b) With a suitable diagram explain the elements of the analysis model (8)
   c) With an example explain about DFD. (4)
5) a) Explain the extensions of DFD for real time systems. (8)
   b) Discuss the features of state transition diagram and its application. (8)
6) a) Explain the feasibility studies. What are the outcomes? Does it have either implicit or explicit effects on software requirement collection? (8)
   b) What is the prototyping technique? How prototype models are prepared for a software process? Discuss. (8)
7) a) Describe how software requirements are documented? State the importance of documentation. (8)
   b) Explain the software requirement analysis and modeling. (8)
8) Explain the state oriented approaches for representing behavioral specifications of software. (16)
9) Narrate the importance of software specification of requirements.
   Explain a typical SRS structure and its parts. (16)
10) Discuss in detail the FAST method of
    a. Requirement elicitation with an example. (8)
    b. What is software specification? (8)
11) Write short notes on data modeling? (6)
    a. Discuss in detail the basic structure of analysis model. (10)
12) How is SRS for a development project arrived at? (6)
    a. What minimum features are required to be present in a good SRS?(10)

**UNIT III - ANALYSIS, DESIGN CONCEPTS AND PRINCIPLES**

**PART A (2 MARKS)**

1) What do you mean by horizontal and vertical partitioning?
2) How do you evaluate user interface?
3) Why software architecture is important in a software process?
4) Distinguish between horizontal and vertical partitioning?
5) How reliability is related to quality assurance?
6) Distinguish between horizontal and vertical partitioning?
7) What is the software architecture?
8) Compare data flow oriented design and data structured oriented design
9) What is the role of verification during a software exercise?
10) Distinguish between hard and soft real time systems.
11) Distinguish between product and process metrics.
12) What do you mean by reuse of design and update of a design as per technology changes and customer psychology?
13) What is the work product of software design process and who does this?
14) Enumerate different data flow architectures
15) How do you describe software interface?
16) How the requirements are collected for user interface of software?
17) What is transaction mapping? How it is used in software design?
18) What are the various models produce by the software design process?
19) What is the quality parameters considered for effective modular design?

**PART B**

1. What is transform mapping? Explain the process with an illustration. What is its strength and weakness? (16)
2. a) Explain about the various design concepts considered during design? (12)
   b) Write short notes on user interface design process? (4)
3. a) Explain data architectural and procedural design for a software? (8)
   b) Describe the design procedure for data acquisition system (8)
4. Explain the importance of user interface design in sale of software. (16)
5. Describe decomposition levels of abstraction and modularity concepts in software design? (16)
6. What are the characteristics of a good design? Describe different types of coupling and cohesion. How design evaluation is performed? (16)
7. Draw the basic structure of analysis model and explain each entity in detail. (16)
8. a) discuss in detail about the design process in software development process (8)
   b) Justify “Design is not coding and coding is not design”. (8)
9. a) Explain in detail about the characteristics and criteria for a good design. (10)
   b) Describe the golden rules for interface design. (6)
10. a) What is the design document?
    b) How is it organized?
11. What are the various software architectures available for the developer according to you? Which is the best and why? (8)
12. What do you mean by modularity in software development? Why is it needed? What is its strength? (8)
13. a) What are the various model of abstraction? Discuss any two in detail? (8)
    b) How does a real time system design differ comparing distributed system design? (8)
14. a) Explain the set of principles for software engineering design? (10)
    b) Describe the concept of information hiding. (6)
15. a) What is data flow oriented design. (3)
b) Draw a detailed dataflow diagram for library management. (10)
c) What are the components dataflow oriented design. (3)

16. a) What is SCM? (4)
   b) How are SCM tasks practiced over the operational life of software? (6)
   c) What is the impact of requirement changes during development of a software product? (6)

UNIT IV - TESTING
PART-A (2 MARKS)

1. What is stress testing?
2. State the objectives and guidelines for debugging.
3. Distinguish between verification and validation:
4. What are the roles of testing tools?
5. What do you mean by test case management?
6. Distinguish between alpha and beta testing?
7. What are the approaches of debugging?
8. What are the roles of cyclomatic complexity value in software resting?
9. What is the need for cyclomatic complexity?
10. Distinguish between black and white box testing:
11. What is white box testing and what is the difficulty while exercising it?
12. Why testing is important with respect to software?
13. Define black box testing strategy?
14. What is static and dynamic testing?
15. How regression and stress tests are are performed?
16. Write short notes on equivalence partitioning?
17. Write the types of system tests?

PART B

1. Discuss the differences between black box and white box testing models. Discuss how these testing models may be used together to test a program schedule. (16)
2. a) What do you mean by system testing? Explain in detail (12)
   b) Explain boundary value analysis. (4)
3. a) Justify the importance of testing process(8)
   b) Discuss in detail about alpha and beta testing. (8)
4. What do you mean by integration testing? Explain their outcomes: (16)
5. What is black box testing? Is it necessary to perform this? Explain various test activities: (16)
6. Explain the integration testing process and system testing process and discuss their outcomes: (16)
7. a) What do you mean by system testing? Give a case study of a system testing for operating system? (8)
   b) What do you mean by boundary value analysis? Give two examples of boundary value testing.(8)
8. Explain black box testing methods and its advantages and disadvantages. (16)
9. Write short notes on
   a) Data flow testing. (8)
   b) Integration testing. (8)
10. a) Explain the testing procedures for boundary conditions.(8)
b) Describe verification and validation criteria for a software. (8)

11. a) Describe unit testing and integration testing. How test plans are generated? (8)
    b) Suggest software testing sequence for a 100% bug free software. Explain. (8)

12. Discuss software failures and faults? What are test coverage criteria? Discuss testing issues: (16)

13. Explain automated testing tools. How test cases are generated? Discuss when to stop testing?
    What is performance testing? Describe. (16)

14. What are the various testing strategies to software testing? Discuss them briefly: (16)

UNIT V - SOFTWARE PROJECT MANAGEMENT

Part A (2 MARKS)

1. List out the importance of cost estimation in software development.

2. Mention the advantages of CASE tools.

3. How do you estimate time required for a software development project?

4. Draw the structure of CASE REPOSITORY and explain.

5. What is meant by software change?

6. Write short notes on empirical estimation models.

7. Why the software needs maintenance?

8. Define software re-engineering.

9. List any 4 categories of CASE tools.

10. What is CASE?

Part B

1. Explain the need for software measures and describe various metrics. (16)

2. Discuss briefly on software maintenance activities and how do you estimate the cost involved. (16)

3. a) Explain in detail about the maintenance process. (8)
    b) Discuss in detail about software evolution. (8)

4. Describe two metrics which are used to measure the software in detail. Discuss clearly the advantages and disadvantages of these metrics. (16)

5. a) What is Halsted’s software science metric. Define. (8)
    b) Explain about function point metric in detail. (8)

6. Write short notes on
    a) Software maintenance (8)
    b) Task scheduling with an example. (8)

7. Explain various cost estimation models and compare. (16)

8. Write briefly on
    a) CASE (8)
    b) Software complexity measure. (8)

9. Explain the maintenance activities and maintenance problems. How the cost of maintenance is estimated? (16)

10. Write short notes on
    a) COCOMO estimation criteria. (8)
    b) Software metrics (8)

11. a) Justify the statement “Software maintenance is costlier”. (8)
    b) Discuss the concept of software maintenance process. (8)