KINGS

COLLEGE OF ENGINEERING
DEPARTMENT OF INFORMATION TECHNOLOGY
QUESTION BANK

Subject Code & Subject Name: IT1251 Software Engineering and Quality Assurance
Year / Sem : II / IV

UNIT I
SOFTWARE PRODUCT AND PROCESS
PART-A (2 MARKS)

1. What is meant by Software Engineering?
2. What are the characteristics of Software?
3. What are the phases of Problem solving Loop?
4. List out the activities of Linear Sequential Model.
5. Mention some of the drawbacks of RAD model.
6. What are the types of changes encountered during the Support phase?
7. Define Business process engineering.
8. What are the elements of Computer based Systems?
9. Define Software Lifecycle.
10. What are the functions of data architecture?
11. Define System Modeling?
12. State the System Engineering Hierarchy?
13. Mention some of the factors to be considered during System Modeling.
14. What are the different architectures developed during BPE?
15. Define Verification &Validation.
16. Write any two software engineering challenges.
17. Which software model leads to software reuse? Why?
18. Give at least two reasons for prototyping is problematic.
19. Differentiate system and computer based system.
20. Define ‘software engineering’ and ‘system engineering’.
21. What is software process model?

PART B

1. Explain the linear software life cycle model with suitable illustration. Bring out the demerits of this model. (16)
2. (a) How do you differentiate software engineering from system engineering? (6)
   (b) For each of the types of process models, identify the types of project suitable to implement. (6)
   (c) Distinguish between verification and validation process. (4)

3. (a) What is meant by generic view of software engineering? Brief it. (8)
   (b) Explain the process model which is useful when staffing is unavailable for complete implementation. (8)
4. (a) What is the difference between system and computer based system?(8)
   (b) What is prototyping? Mention its types. Also explain this model with advantages and disadvantages. (8)
5. Define Software process model? Explain any one of it with a neat diagram(16)
6. Explain the hierarchy of Business process Engineering. (16)
7. Explain Software Life cycle process (16)
8. Explain Evolutionary process model (16)
9. Explain the different layers of Software Engineering? (16)
10. (a) Describe the process model which defines a network of activities? (8)
    (b) Why the "first system's throw away system? Explain the concept with advantages and disadvantages. (8)
11. (a) Draw a system engineering hierarchy diagram and explain the concept? (8)
    (b) Explain the process model that combines the elements of waterfall and iterative fashion. (8)

UNIT-II
SOFTWARE REQUIREMENTS
Part- A (2 MARKS)

1. What is meant by System Requirements?
2. What are the types of Software system requirements?
3. Write down the functional requirement for a Library management system.
4. Mention some of the Notations for requirements specification.
5. Define the term product and process in software engineering
6. Define Requirement Engineering.
7. Mention some of the process activities of Requirement Elicitation & analysis.
8. What are the different types of checks carried out during Requirement Validation?
9. Define Traceability
10. Draw the principle stages of Change management process.
11. State the primary objectives of analysis Model.
12. Define Data objects, attributes & relationship.
13. Define Cardinality & Modality.
14. State Entity /Relationship diagram.
15. Define Data Flow Diagram.
16. What is meant by Information flow Continuity?
17. Define Behavioral Modeling.
18. What is meant by Data dictionary?
19. What does data dictionary contains?
20. What is meant by Throw away Prototyping?
21. Specify at least six context free questions.
22. What is the purpose of domain analysis?

23. List some non-functional requirements of software, with an example.

Part - B

1. (a) With a suitable example explain about the application of use cases in deriving the scenarios. (8)
   (b) Explain the various prototyping methods and tools used for requirements analysis. (8)
2. Discuss in detail about the elements in data modeling. (16)
3. (a) Differentiate functional and nonfunctional requirements and explain. (8)
   (b) Why the customer interaction is a difficult process? Explain one formal procedure used for customer interaction. (8)
4. (a) Draw an E-R diagram for university information system. specify at least four Cardinality and modality relationships in this. (8)
   (b) Explain the relationships between data and control models with diagram. (8)
5. (a) Explain the feasibility studies. What are the outcomes? Does it have either explicit or implicit effects on software requirement collection? (8)
   (b) What are prototyping techniques? How prototype models are prepared for software process? Discuss. (8)
6. (a) Describe how software requirements are documented? State the importance of documentation. (8)
   (b) Explain the software requirement analysis and modeling. (8)
7. Explain Transform Mapping with Safe home Software. (16)
8. Explain briefly Functional Modeling. (16)
9. Explain the various Design concepts in detail. (16)
10. Discuss the various phases of Analysis Modeling. (16)

UNIT-III

ANALYSIS, DESIGN CONCEPTS AND PRINCIPLES

Part- A (2 MARKS)

1. What is the use of Architectural design?
2. Define Software design.
3. Mention some of the Design principles.
4. State Procedural abstraction.
5. What does Data abstraction contains?
6. What does Modularity concept mean?
7. Mention some of the criteria are used to define effective modular design.
8. Define Fan-in & Fan-out.
9. Differentiate horizontal partitioning & vertical partitioning.
10. Write down the concept of Functional independence.
11. Distinguish between expected requirements and exciting requirements.
12. What is meant by software prototyping?
13. What is the work product of software design process and who does this?
14. Define the term “software architecture.”
15. What is meant by transaction mapping? How it is used in software design?
16. What are the criteria based on which the lower and upper bounds on the number of modules for a software is decided?
17. What re the types of coupling?

18. Name the three levels of abstraction, which re in practice for the design.
19. Why modularity is important in software projects?
20. Differentiate version control and change control.
21. Draw a ACD for safe home security system.
22. Differentiate Transform flow and Transaction flow.

Part - B

1. (a) Which is a measure of interconnection among modules in a program structure? Explain. (8)
   (b) What is he difference between Level-0 and Level-1 DFD? draw a Level-0 and Level-1 DFD for safe Home Security System. (8)
2. (a) How the interrupts are handled in real time systems? Explain. (8)
   (b) How to identify the objects in the software configuration? Explain in detail. (8)
3. What are the different types of architectural styles exist for software and explain any one software architecture in detail. (16)
4. (a) Describe activities of SCM in detail. (8)
   (b) Explain the user interfaces design activities. (8)
5. (a) Explain data, architectural and procedural design for a software explain. One software architecture in detail. (8)
   (b) Describe the design procedure for a data acquisition system. one software architecture in detail. (8)
6. Discuss briefly Effective Modular Design. (16)
7. Explain Real Time Systems. (16)
8. What is Software Architecture? Explain it. (16)
9. (a) Draw a translating diagram for analysis model into a software design specification. (8)
   (b) Given complete template for documentation design specification. (8)
10. (a) How the interrupts are handled in real time systems? Explain. (8)
    (b) Write a note on real time software design. (8)

UNIT-IV
TESTING
Part - A (2 MARKS)

1. Define black box testing strategy.
2. What is meant by software change?
3. Why testing is important with respect to software?
4. Write short notes on empirical estimation models.
5. Justify the term “Software is engineered”
6. Define software scope.
7. Define process maturity.
8. Distinguish between alpha testing and beta testing.
9. What is software architecture?
10. Assume a program for computing the roots of a quadratic equation. List out the test cases using equivalence partitioning method.
11. Write the steps involved in testing real time systems.
12. How the regression and stress tests are performed?
13. State the objectives and guidelines for debugging.

14. Which is called as glass box testing? What is the objective of this?
15. List out the data structure errors identified during unit testing.
16. What is regression testing?
17. What is smoke testing?
18. What is recovery testing?
19. What are the guidelines for equivalence classes?
20. What is software testing?
21. What is structural testing?
22. Define top-down testing.

Part - B

1. (a) How to derive test cases for the given project? Explain with detail. (8)
   (b) How the RST (Reflexive, Symmetric and Transitivity) condition is verified in black box testing? Explain with example. (8)
2. (a) Why unit testing is so important? Explain the concept of unit testing in detail. (8)
   (b) Write a note on regression testing. (8)
3. (a) Explain the testing procedure for boundary conditions. (8)
   (b) Describe verification and validation criteria for software. (8)
4. (a) Describe unit testing and integration testing. How test plans are generated. (8)
   (b) Suggest software testing sequence for 100% bug free software explains. (8)
5. (a) Why is testing important? (6)
   (b) Narrate the path testing procedure in detail with a sample code. (10)
6. (a) Distinguish between black box and white box testing. (6)
   (b) Explain the different integration testing approaches. (10)
7. Explain in detail Black box testing in detail (16)
8. How Boundary test conditions are achieved? (16)
9. Explain in detail Structural testing? (16)
10. Explain in detail Software Testing Strategies. (16)
11. Explain the test coverage criteria based on Data flow mechanisms. (16)

UNIT – V
SOFTWARE QUALITY ASSURANCE
Part – A (2 Marks)

1. Define Process.
2. Define Product.
3. Define Software quality.
4. Define software metrics.
5. Mention the types of metrics.
6. Define Quality control.
7. Define Software Quality Management
8. Define Software Configuration Management
9. List the steps involved in Process Improvement
10. Mention the types of software metrics.
11. What is software quality assurance?
12. Define Quality Planning.

Part B

1. Explain the Classification of metrics? (16)
2. Explain about CASE tools? (16)
3. Explain Process and Product Quality. (16)
4. Explain in detail about quality assurance and standards. (16)
5. Explain about complexity metrics and Models? (16)
6. Explain about the software metrics. (16)
7. Explain in detail about Quality planning and control. (16)
8. Explain about Software Configuration Management. (16)
9. What are all the formulas for cyclomatic compleity? Calculate cyclomatic Complexity for greatest of three numbers. (16)
10. Explain in detail about Process Improvement. (16)