SRM VALLIAMMAI ENGINEERING COLLEGE
(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

QUESTION BANK

M.E-CSE- I SEMESTER
1912104– ADVANCED SOFTWARE ENGINEERING
Academic Year 2020 – 21 ODD

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QUESTION BANK

SUBJECT : ADVANCED SOFTWARE ENGINEERING

SEM / YEAR : I/ M.E-CSE -First year

UNIT I - INTRODUCTION			
Software engineering concepts – Development activities – Software lifecycle models - Software Process-Generic process- Classical waterfall - Iterative waterfall – Prototyping – Evolutionary - Spiral –Agile Development. .			
PART-A (2 - MARKS)			
Q. No	**QUESTIONS**	**BT Level**	**Competence**
1.	.Differentiate Software Engineering and System Engineering. Give an example.	Understand	BTL-2
2.	Demonstrate your understanding of umbrella activities of a Software process.	Remember	BTL-1
3.	List out the Challenges for Software Engineers?	Apply	BTL-3
4.	Write the IEEE definition of software engineering	Remember	BTL-1
5.	If you have to develop a word processing software product, what process model will you choose? Justify your answer and examine.	Apply	BTL-3
6.	Explain How do we create a process that can manage unpredictability?	Evaluate	BTL-5
7.	Identify the human factors considered for an agile software development.	Remember	BTL-1

8.	Is it possible to realize Win-Win spiral model for software.	Analyze	BTL-4
9.	Summarize the pros and cons of iterative software development model?	Evaluate	BTL-5
10.	Define Legacy Software Systems?	Remember	BTL-1
11.	List two deficiencies in waterfall model. Which process model do you suggest to overcome each deficiency	Remember	BTL-1
12.	Compare perspective and specialized process model.	Analyze	BTL-4
13.	Predict about the Generic framework activities?	Understand	BTL-2
14.	Discuss about the various drawbacks of spiral model.	Understand	BTL-2
15.	Generalize on any two characteristics of software as a product.	Create	BTL-6
16.	Show what led to the transition from product oriented development to process oriented development.	Apply	BTL-3
17.	Differentiate PSP and TSP.	Analyze	BTL-4
18.	Create Agility Principles for those who want to achieve agility?	Create	BTL-6
19.	Summarize on extreme programming.	Understand	BTL-2
20.	Write about Adaptive Software Development and Scrum?	Remember	BTL-1
PART-B (13- MARKS)			
1.	Define Software Process. List all generic process framework and explain umbrella activities in detail.(13)	Remember	BTL-1
2.	(i) Explain the following a)classical Sequential model.(4) b)waterfall model is preferable compare to all other models.(3) (ii) What are the pros and cons of using mathematical approach for software development?(7)	Analyze	BTL-4
3.	(i) What is the impact of reusability in software development process?(6) (ii) Explain the component based software development model	Remember	BTL-1

	with a neat sketch(7)		
4.	(i) write short notes on: a) Specialized Process Model(3) b) Concurrent Models(3) (ii) Explain in detail about personal process models and team process models.(7)	Evaluate	BTL-5
5.	(i) What is a process model? Describe the process model that you would choose to manufacture a car explain giving suitable reasons(6) (ii) Describe the various Evolutionary Process Models with neat diagram. (7)	Understand	BTL-1
6.	(i) Compare the life cycle models based on their distinguishing factors, strengths and weaknesses.(6) (ii) Discuss the prototyping model .what is the effect of designing a prototype on the overall cost of the software project?(7)	Analyze	BTL-4
7.	(i) Explain in detail about iterative and waterfall model.(6) (ii) Explain CMM model with its capability levels. specific goals and the associated specific practices defined for project planning.(7)	Analyze	BTL-4
8.	(i) Discuss RAD developmental model and states its merits and demerits.(7) (ii) what is the significance of the spiral model when compared with other model .(6)	Understand	BTL-2
9.	(i) Discuss the Extreme Programming process.(7) (ii) What are some of the issues that lead to an XP debate?(6)	Understand	BTL-2
10.	(i) Illustrate about agility and cost of change. (6) (ii) What key traits must exist among the people on an	Apply	BTL-3

	effective software team? (7)		
11.	(i) what is agility in the context of software engineering work? (6) (ii) List the principles of agile software development.(7)	Understand	BTL-2
12.	(i) Compose your view about agile software development. (6) (ii) Generalize your view about extreme programming. (7)	Create	BTL-6
13.	(i) Describe about pair programming and how unit tests used in XP? (7) (ii) List the new practices of Dynamic systems development models.(6)	Remember	BTL-1
14.	(i) explain Unified process with its Phases.(7) (ii) write a note on the unique characters of a software. (6)	Apply	BTL-3
PART-C (15- MARK)			
1.	Generalize, if software engineering applicable when webApps are built? , If so, how might it be modified to accommodate the unique characteristics of WebApps?	Create	BTL-6
2.	Compare the waterfall model, spiral model and concurrent model based on their distinguishing factors, strengths and weakness.	Evaluate	BTL-5
3.	Explain about the umbrella activities which support software development process and discuss about their necessity in maintaining the quality in both software process and product that is being developed for railway reservation system.	Evaluate	BTL-5
4.	Assume that Most agile process models recommend face to face communication. Yet today, members of a software team and their customers may be geographically separated from one another. Do you think this implies that geographical separation is something to avoid? Can you think of ways to overcome this Problem?	Evaluate	BTL-5

UNIT II- SOFTWARE REQUIREMENT

Representation of Requirement –Data flow, ER Diagram, View point, Controlled Requirement Expression, Structured Analysis and Design Technique, Viewpoint Oriented Requirements Definition- Case Study: Requirement Engineering Tools.

PART-A (2 - MARKS)

Q.No	QUESTIONS	BT Level	Competence
1.	Give a use of Requirement Engineering?	Understand	BTL-2
2.	Define feasibility study. And list the types?	Remember	BTL-1
3.	Classify functional /non-functional requirements for a SafeHome Surveillance.	Apply	BTL-3
4.	Explain a Elicitation work products?	Analyze	BTL-4
5.	List the characteristics of a good system requirements specification(SRS)	Remember	BTL-1
6.	Define quality function development(QFD)	Remember	BTL-1
7.	How requirements are classified? List them with an example for each.	Apply	BTL-3
8.	Draw and Develop Use –Case diagram for SafeHome System	Create	BTL-6
9.	Differentiate between ER Diagram and Data Flow diagram.	Understand	BTL-2
10.	Point out the problems faced when user requirements are written in natural language?	Analyze	BTL-4
11.	Distinguish between the terms inception, elicitation and elaboration with reference to requirements.	Understand	BTL-2
12.	List out the Constraints for analysis patterns of requirement modelling.	Remember	BTL-1
13.	Classify how much analysis is enough?.	Analyze	BTL-4
14.	Express the different between Collaborations and Consequences .	Understand	BTL-2
15.	Explain how to manage changing requirements during the	Evaluate	BTL-5

	requirements elicitation process?		
16.	What is meant by structural analysis and volatile requirement?	Remember	BTL-1
17.	Classify the Viewpoint Oriented requirements.	Apply	BTL-3
18.	Define Requirement engineering Tools?	Remember	BTL-1
19.	Explain, how the requirements are validated?	Evaluate	BTL-5
20.	Generalize what.is information flow continuity?	Create	BTL-6
PART-B (13- MARK)			
1.	(i) Differentiate functional and non-functional requirements.(6) (ii) Give the steps involved in initiating requirements engineering.(7)	Understand	BTL-2
2.	(i) What are called as non-functional requirements? Explain in detail.(7) (ii) Summarize on user requirements and system requirements in detail.(6)	Understand	BTL-2
3.	(i) List and explain the Three aspects that SRS should clearly document.(7) (ii) List the characteristics of good SRS document and their components.(6)	Remember	BTL-1
4.	(i) Demonstrate the structure of Data Flow Diagram.(7) (ii) Show the Data Flow diagram for Home Automation.(6)	Apply	BTL-3
5.	(i) Explain the ER Diagram in detail.(7) (ii) Describe the ER Diagram attributes with an example.(6)	Remember	BTL-1
6.	Analyze about the View point in detail with examples.(13)	Analyze	BTL-4
7.	(i) What is the purpose of feasibility study?(2) (ii) State the inputs and results of the feasibility study.(4) (iii) List any four issues addressed by a feasibility study.(4) (iv) Elaborate the phases involved when carrying out a feasibility study.(3)	Remember	BTL-1
8.	What is requirement elicitation? Briefly describe the various activities performed in requirements elicitation with an	Evaluate	BTL-5

	example of a watch system that facilitates to set time and alarm and assess.(13)		
9.	i) what is controlled Requirement Expression ?how it helps in requirement engineering process.(4) ii) how will you classify the requirement types of a project, give example.(5) iii) List the stake holders and all types of requirements for an online banking system .(4)	Create	BTL-6
10.	Write short notes on the list given below (i) Requirements discovery.(3) (ii) Interviewing.(3) (iii) Scenarios.(3) (iv) Use cases.(2) (iv) Ethnography.(2)	Remember	BTL-1
11.	(i) Classify the different types of Structured Analysis and Design Techniques(7) (ii) Demonstrate on the Viewpoint Oriented Requirements .(6)	Apply	BTL-3
12.	(i) Discuss about the requirement Engineering tools.(7) (ii) Describe about the requirement change management.(6)	Understand	BTL-2
13.	(i) Analyze Briefly about the Tools helpful in gathering requirements.(6) (ii) Explain how can we create Behavior Model .(7)	Analyze	BTL-4
14.	(i) What is the purpose of data flow Data flow diagrams? What are the notations used for the same.(7) (ii) Explain by constructing a context flow diagram level-0 DFD and Level-1 DFD for a library management system.(6)	Analyze	BTL-4
PART-C (15 -MARKS)			
1.	Develop a High level Use case diagram for Safe Home Systems	Create	BTL-6

2.	Assess on Software requirement specification for Railway Reservation system	Evaluate	BTL-5
3.	Draw and Explain the ER diagram for an ATM system in requirement elicitation. 1. Making a withdrawal at an ATM 2. Using your charge card for a meal at a restaurant 3. Searching for books using an on-line bookstore	Evaluate	BTL-5
4.	Develop a class model for the Online Air-Ticketing system	Create	BTL-6
UNIT III- ARCHITECTURE AND DESIGN			
Software design – Design process – Design concepts – Coupling – Cohesion – Functional independence – Design modeling – static and dynamic modeling-Architectures for network, mobile, and embedded system.			
PART-A (2 - MARKS)			
1.	What do you infer from design heuristics?	Understand	BTL-2
2.	List two principles of good design.	Remember	BTL-1
3.	What do you interpret from the design quality attributes 'FURPS'?	Analyze	BTL-4
4.	Draw the diagram for translating the requirements model to design model .	Remember	BTL-1
5.	'A system must be loosely coupled and highly cohesive'. Justify.	Evaluate	BTL-5
6.	Define Modularity.	Remember	BTL-1
7.	Give the various types of architectural styles with example.	Understand	BTL-2
8.	What is coupling and list the various types of coupling?	Remember	BTL-1
9.	How do you apply modularization criteria for monolithic software? Discuss.	Understand	BTL-2
10.	Define mapping.	Remember	BTL-1
11.	Analyze an UI design pattern are used for the following? i) page layout ii) Tables iii) Navigation through menus and webpages	Analyze	BTL-4

	iv) shopping cart.		
12.	Distinguish between transform flow and transaction flow.	Understand	BTL-2
13.	List the basic design principles of class based component.	Remember	BTL-1
14.	Pointout the steps that are applied to develop a decision table in tabular design notation.	Analyze	BTL-4
15.	Classify the four distinct frame work activity in the user interface analysis and design process.	Apply	BTL-3
16.	Design the architectural context diagram.	Create	BTL-6
17.	In case of user interface analysis, assess the steps that are taken for understanding the problems.	Evaluate	BTL-5
18.	Classify the user interface design steps for network architectures.	Apply	BTL-3
19.	Show the facilities to be provided in a system to recover users from the mistakes.	Apply	BTL-3
20.	Generalize on the concept of user interface design pattern for embedded systems.	Create	BTL-6
PART-B (13- MARKS)			
1.	Explain the design process and list the design concepts in detail?(13)	Remember	BTL-1
2.	Explain about object oriented design concepts.(13)	Evaluate	BTL-5
3.	Analyze your understanding on the following design models (i) Data design elements.(2) (ii) Architectural design elements.(2) (iii) Interface design elements.(3) (iv) Component-level design elements.(3) (v) Deployment-level design elements.(3)	Analyze	BTL-4
4.	(i) Demonstrate in detail about l Design Model (7)	Apply	BTL-3

	(ii) Illustrate in detail about any four Architectural styles.(6)		
5.	(i) Give the steps involved in transform mapping.(6) (ii) Discuss transform mapping with example.(7)	Understand	BTL-2
6.	(i) List the steps involved in Transaction mapping.(6) (ii)Describe Transaction mapping with example.(7)	Remember	BTL-1
7.	(i) Discuss the basic design principles of Class based components.(7) (ii) Discuss the component-level design guidelines.(6)	Remember	BTL-2
8.	Describe the various coupling and cohesion methods used in software design. (13)	Understand	BTL-2
9.	Examine Architectural Styles. (i) Data centered Architecture. (3) (ii) Data Flow Architecture.(3) (iii) Call and Return Architecture. (3) (iv) Object Oriented Architecture.(2) (v) Layered Architecture. (2)	Apply	BTL-3
10.	(i) Analyze on the concept of Graphical Design notation.(6) (ii) Explains Tabular Design Notation.(7)	Analyze	BTL-4
11.	i) Describe about user interface analysis in detail.(7) ii) Explain the general model of a hard real time systems.(6)	Remember	BTL-1
12.	(i) Generalize on the concept of user interface design and list the characteristics of a good user interface design (7) (ii) Develop the design issues in Dynamic modeling.(6)	Create	BTL-6
13.	(i) Analyze about program design language in static modeling of the system.(6) (ii) Classify and Explain the various architecture methods for embedded systems.(7)	Analyze	BTL-4
14.	i) Describe the Architectures for Network systems with an example.(7) ii)Discuss the design process for Mobile application systems.(6)	Remember	BTL-1

PART-C(15 -MARKS)			
1.	Model an Architectural design for SafeHome systems.	Evaluate	BTL-5
2.	What is the purpose of Context level DFD? What are the components of DFD? Create the various levels of DFD for the SafeHome Security function for monitors sensors transform and flow boundaries. .	Create	BTL-6
3.	Summarize the architectural pattern and framework are often encountered in discussions of software architecture.do some research and describe how each of these terms differs from its counterparts.	Evaluate	BTL-5
4.	Create the swim line diagram for prescription refill function.	Create	BTL-6
UNIT IV- TESTING			
Testing – Unit testing – Cyclomatic Complexity -Black box testing– White box testing – Integration and System testing– Regression testing			
PART-A (2 -MARKS)			
1.	Describe the objectives of testing? What is "cyclomatic complexity"? Point out its primary use.	Remember	BTL-1
2.	Analyze on what is a "good" test and List two principles of good design.	Analyze	BTL-4
3.	Differentiate verification and validation. Which type of testing address verification? Which type of testing address validation?	Understand	BTL-2
4.	Identify What methods are used for Basis Path testing?	Remember	BTL-1
5.	What is flow graph notation and show how it is important in white box testing?	Remember	BTL-1
6.	Measure the performance of equivalence partitioning.	Evaluate	BTL-5
7.	What is controllability in testing?	Remember	BTL-1

8.	Pointout the purpose of stud and driver used for testing.	Analyze	BTL-4
9.	What are the generic characteristics of software testing?	Remember	BTL-1
10.	Summarize various testing strategies for conventional software?	Understand	BTL-2
11.	Examine how the software Testing results related to the reliability of the software.	Remember	BTL-1
12.	Between "statement coverage and Branch Coverage", Examine which is a stronger criteria? Why?	Apply	BTL-3
13.	Identify and analyze the pair testing.	Apply	BTL-4
14.	Give the testing principles the software engineer must apply while performing the software testing.	Understand	BTL-2
15.	Generalize your opinion about Smoke Testing.	Create	BTL-6
16.	Classify the Scenario testing process.	Apply	BTL-3
17.	Show your understanding on Testing object oriented applications	Apply	BTL-3
18.	Generalize on What options exist when we are faced with a poorly designed and implemented program?	Create	BTL-6
19.	Give the intertask testing.	Understand	BTL-2
20.	Assess on Testing documentation and help facilities.	Evaluate	BTL-5
PART-B (13- MARKS)			
1.	Describe the type's basic path testing given. (i)Flow graph notation .(5) (ii) Independent program paths.(8)	Remember	BTL-1
2.	What is black box testing? Explain the different types of black box testing strategies. Explain by considering suitable examples.(13)	Analyze	BTL-4
3.	(i) Write elaborately on unit testing. How do you develop test suites.(7) (ii) Explain how to broaden testing coverage and improve the	Remember	BTL-1

	quality of white box-testing.(6)		
4.	(i) What is cyclomatic complexity and what are the ways to compute it?(5) (ii) Give the steps to select the path in data flow testing?(5) (iii) Explain how the various types of loops are tested?(3)	Understand	BTL-2
5.	(i) Describe in detail about software testing strategies.(7) (ii) Explain in detail about any one control structure testing.(6)	Remember	BTL-1
6.	(i) Summarize on Top-down Integration testing and Bottom - up integration testing .(8) (ii) Describe Testing in OOAD Models.(5)	Understand	BTL-2
7.	(i) How would you apply your understanding about Testing for Real –time Systems?(7) (ii) What is Orthogonal Array testing? When is it needed? Explain with an example.(6)	Apply	BTL-3
8.	(i) Analyze on equivalence partitioning. List rules used to define valid and invalid equivalence classes. explain the technique using examples.(7) (ii) What is boundary value analysis? Explain the technique specifying rules and its usage with the help of an example.(6)	Analyze	BTL-4
9.	(i) What conclusions can you draw from regression testing? Support your answer with a neat sketch.(7) (ii) explain the list given below (i) Task Testing.(2) (ii) Behavioural Testing.(2) (iii) Database Testing.(2)	Evaluate	BTL-5
10.	Write a generalize concept on the following system testing (i) Recovery testing.(4) (ii) Security testing.(4) (iii) Graph-based testing.(5)	Create	BTL-6
11.	(i) Describe in detail about Testing on client server	Remember	BTL-1

	applications .(7) (ii) Explain Testing Documentation in detail.(6)		
12.	Apprise and analyze the purpose of system testing with a high level explanation on all its types.(13)	Analyze	BTL-4
13.	(i) What is the purpose of patterns for software testing? (7) (ii) Summarize the activities involved in Patterns testing.(6)	Understand	BTL-2
14.	(i) Explain in detail about Object-oriented Testing methods.(7) (iii) Explain Fault based testing.(6)	Apply	BTL-3
PART-C (15-MARKS)			

1.	Consider the following program segment.
	/*num is the number of function searches in a presorted integer array arr*/
	int bin_search(int num)
	{
	int min , max; min=0; max=100;
	while(min!=max) {
	if(arr[(min+max)/2]>num)
	max=(min+max)/2;
	else if(arr[(min+max)/2]
	min=(min+max)/2;
	else return((min+max)/2);
	}
	return(-1);
	}
	(i)Draw the control flow graph for this program segment.
	(ii)Define cyclomatic complexity.
	(iii)Determine the cyclomatic complexity for this program.(Show the intermediate steps in your computation. writing only the final result is not sufficient)
		Evaluate	BTL-5

2.	Consider why do we have to retest subclasses that are instantiated from an existing class, if the existing class has already been thoroughly tested? Can we use the test case design for the existing Class?	Evaluate	BTL-5
3.	Given a set of numbers 'n', the function findprime(a[],n) prints a number if it is a prime number. Draw a control flow graph, calculate the cyclomatic complexity and enumerate all paths. state how many test cases are needed to adequately cover the code in terms of branches, decisions and statement? Develop the necessary test cases using sample values for 'a' and 'n'.	Create	BTL-6
4.	Generalize and create the test cases and Test Derives for ATM system.	Create	BTL-6
UNIT V- MAINTENANCE			
Software maintenance framework- Enhancing maintenance productivity, maintenance teams, potential solutions to maintenance problem - Reverse Engineering- Maintenance tools: Criteria for selecting tools, taxonomy of tools			
PART-A (2 -MARKS)			
1.	Define Software Maintenance.	Remember	BTL-1
2.	What is Supportability?	Analyze	BTL-1
3.	Assess how Reengineering is useful in maintenance?	Evaluate	BTL-5
4.	Analyze on how are the Business Process Reengineering is used?	Analyze	BTL-4
5.	List out the Activities of BPR.	Remember	BTL-1
6.	Discuss Forward Engineering?	Understand	BTL-2
7.	Give the purpose of Document Restructuring.	Understand	BTL-2
8.	Compare data restructuring and code restructuring.	Evaluate	BTL-5
9.	Predict on what is Reverse Engineering?	Understand	BTL-2
10.	Examine the need of Maintenance team.	Remember	BTL-1
11.	Describe the general maintenance problems.	Remember	BTL-1

12.	Give some steps in Reengineering.	Understand	BTL-2
13.	Relate Restructure code with Reliability.	Apply	BTL-3
14.	Generalize on how Reverse engineering is used in understanding of the processing	Create	BTL-6
15.	List out the tools for maintenance.	Remember	BTL-1
16.	What are potential solutions for maintenance problems?	Analyze	BTL-4
17.	What do you infer from productivity?	Analyze	BTL-4
18.	Write a note on taxonomy of maintenance tools	Apply	BTL-3
19.	Show the basic principles that guide to select maintenance tools.	Apply	BTL-3
20.	Generalize on the concept of Framework of maintenance.	Create	BTL-6
PART-B(13 MARKS)			
1.	(i) Examine the activities associated with software Maintenance(7) (ii)write short notes on Software Supportability.(6)	Remember	BTL-1
2.	(i) What elements used in Reengineering? (6) (ii) Explain in detail about the Reengineering for software maintenance. (7)	Analyze	BTL-4
3.	How do work with Business Processes reengineering and use it to assess progress.(13)	Create	BTL-5
4.	Develop a model of BPR with all individual processing steps.(13)	Evaluate	BTL-6
5.	(i) Summarize the software reengineering activities.(6) (ii) Discuss the steps involved in Document Restructuring.(4) (iii)State inventory analysis.(3)	Understand	BTL-2
6.	Demonstrate on the following list given below (i) Code Restructuring in reengineering. (6) (ii) Data Restructuring in Reengineering. (7)	Apply	BTL-3
7.	Describe in detail about the following (i) Reverse Engineering(4)	Remember	BTL-1

	(ii) Internal Data Structures.(4) (iii) Database Structures.(5)		
8.	(i) Explain in detail about Reverse Engineering with process diagram.(6) (ii) Analyze on the concept of Data understanding in Reverse Engineering.(7)	Analyze	BTL-4
9.	(i) Discuss about Restructuring in a software development life cycle.(7) (ii) Discuss on the concept of. Forward Engineering(6)	Understand	BTL-2
10.	(i) Discuss the process of Forward engineering for client-server Architectures.(7) (ii) Describe a task Forward engineering for Object Architectures.(6)	Remember	BTL-1
11.	(i) Explain in detail about Enhancing maintenance productivity.(7) (ii).Explain in detail about Maintenance teams (6)	Analyze	BTL-4
12.	(i) Apply Reverse Engineering for fixing maintenance problem.(7) (ii) Outline the importance of Maintenance tools (6).	Apply	BTL-3
13.	Explain the criteria for selecting tools for maintenance of the software.(13)	Understand	BTL-2
14.	(i) Describe in detail about Taxonomy of tools.(7) (ii) How should we use maintenance tools during the software project itself?(6)	Remember	BTL-1
PART-C(15 MARKS)			
1.	Compute and prepare the business process in which you played a part. Use the BPR model to describe the changes you recommend to the process in an effort to make it more efficient.	Create	BTL-6
2.	Prepare the inventory analysis checklist presented at the SEPA website and attempt to develop a Quantitative software	Create	BTL-6

	rating system that could be applied to existing programs in an effort to pick candidate programs for reengineering.		
3	Explain in detail why completeness difficult to achieve as abstraction level increases?	Evaluate	BTL-5
4.	Evaluate the cost benefit analysis of reengineering?	Evaluate	BTL-5