



**SIDDHARTH GROUP OF INSTITUTIONS:: PUTTUR  
(AUTONOMOUS)**

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**QUESTION BANK (DESCRIPTIVE)**

**Subject with Code:** SE&T(19CI0603)

**Course & Branch:**B.Tech - CSIT

**Year &Sem:** III-B.Tech & I-Sem

**Regulation:** R19

**UNIT –I  
INTRODUCTION SOFTWARE METRICS**

- |   |   |   |           |       |
|---|---|---|-----------|-------|
| 1 | a | What do you mean by software crisis? Identify the reasons for software crisis.  | [L3][CO1] | [4M]  |
|   | b | What is more important product or process? Justify your answer.   | [L5][CO1] | [3M]  |
|   | c | What do you understand by term software development life cycle? Why it is important to while developing a software product?   | [L1][CO1] | [3M]  |
| 2 | a | Compare iterative enhancement model and evolutionary process model.   | [L2][CO1] | [4M]  |
|   | b | Discuss the prototyping model. What is the effect of designing a prototype on the overall cost of the software project?   | [L5][CO1] | [6M]  |
| 3 | a | Compare the waterfall model and the spiral model of software development.   | [L2][CO1] | [4M]  |
|   | b | Describe the rapid application development (RAD) model. Discuss each phase in detail.   |           | [6M]  |
| 4 | a | List the process maturity levels in SEI's CMM. Explain each level.  | [L2][CO1] | [6M]  |
|   | b | Define data structure metrics. How can we calculate amount of data in a program?  | [L2][CO1] | [4M]  |
| 5 | a | Explain the spiral model of software development. What are the limitations of such model?   | [L2][CO1] | [5M]  |
|   | b | Explain the Halstead theory of software science. Is it significant in today's scenario of software development?   | [L5][CO1] | [5M]  |
| 6 | a | Explain in detail the following software metrics with example.<br>i) Size metric.<br>ii) Token Count.   | [L2][CO1] | [6M]  |
|   | b | Write a factorial program in C language. List out the operators and operands and also calculate the values of software science measures like $\eta$ , N, V, E, and $\lambda$ ?  | [L5][CO1] | [4M]  |
| 7 |   | Explain in detail the following software metrics with example.<br>i) Design Count metrics<br>ii) Data structure metrics   | [L2][CO1] | [10M] |
| 8 | a | An application has the following: 10 external inputs, 12 high external outputs, 20 low internal logical files, 15 high external interface files, 12 average external enquiries. And a value of complexity adjustment factor of 1.10. What are the unadjusted and adjusted function pint counts? | [L6][CO1] | [6M]  |
|   | b | Is software metrics required in software engineering? Why do we really need metrics in software.  | [L1][CO1] | [4M]  |
| 9 |   | Explain in detail the following software metrics with example.<br>i) Function pint<br>ii) Information flow metrics  | [L2][CO1] | [10M] |

- 10** Consider a project with the following functional units: [L6][CO1] [10M]
- Number of user inputs = 50  
 Number of user outputs = 40  
 Number of user enquiries = 35  
 Number of user files = 06  
 Number of external interfaces = 04
- Assume all complexity adjustment factors and weighting factors are average. Compute the function points for the project.

**UNIT –II**  
**SOFTWARE PROJECT PLANNING, SOFTWARE REQUIREMENT ANALYSIS AND SPECIFICATIONS**

- 1 a** Explain the cost estimation models. [L1][CO2] [5M]
- b** A database system is developed. The effort has been estimated to be 100 persons- months. Calculate the number of line of code and productivity in LOC/ persons- month. [L6][CO2] [5M]
- 2 a** Compare the Walton-Felix model with the SEL model on a software development expected to involve 12 person-years of effort Software Project Planning. [L6][CO2] [5M]
- (i) Calculate the number of lines of source code that can be produced.  
 (ii) Calculate the duration of the development.  
 (iii) Calculate the productivity in LOC/PY  
 (iv) Calculate the average manning
- b** Identify typical software risk factors. Explain the risk management activities. [L2][CO2] [5M]
- 3 a** What is COCOMO Model? Explain Basic COCOMO model in detail. [L2][CO2] [5M]
- b** Suppose that a project was estimated to be 400 KLOC. Calculate the effort , development time for each of the three modes (i.e., organic, semidetached and embedded and analyze. [L6][CO2] [5M]
- 4 a** Explain Intermediate COCOMO model in detail. [L2][CO2] [5M]
- b** A new project with estimated 500 KLOC embedded system has to be developed. Project manager has a choice of hiring from two pools of developers: very highly capable with very little experience in the programming language being used or developers of low quality but a lot of experience with the programming language. What is the impact of hiring all developers from one or the other pool? [L5][CO2] [5M]
- 5 a** Discuss various types of COCOMO modes. [L6][CO2] [5M]
- b** A project size of 300 KLOC is to be developed. Software development team has average experience on similar type of projects. The project schedule is not very tight. Calculate the effort, development time, average staff size and productivity of the project. [L5][CO2] [5M]
- 6 a** Explain the Putnam resource allocation model. What are the limitations of this model? [L2][CO2] [5M]
- b** A software development project is planned to cost 95 MY in a period of 1 year and 9 months. Calculate the peak manning and average rate of software team build up. [L6][CO2] [5M]
- 7 a** Differentiate functional and non-functional requirements. [L2][CO2] [5M]
- b** Describe the various steps of requirements engineering. Is it essential to follow these steps? [L5][CO2] [5M]
- 8 a** What are the components of an activity diagram? Explain their usage with the help of an example. [L2][CO2] [5M]
- b** Write short notes on Data dictionary. [L6][CO2] [5M]
- 9 a** What are the components of a use case diagram? Explain their usage with the help of an example. [L2][CO2] [5M]

- b Model a Dataflow diagram for a "Library Management System". State and explain the functional requirements you are considering. [L6][CO2] [5M]
- 10 a List the characteristics of good SRS document and their requirements [L2][CO2] [5M]  
b Illustrate E-R diagram with the diagram. [L6][CO2] [5M]

**UNIT –III****SOFTWARE DESIGN, SOFTWARE RELIABILITY**

- 1 a Illustrate software design framework. [L2][CO3] [5M]  
b Define cohesion and coupling. Explain relationship between cohesion and coupling. [L1][CO3] [5M]
- 2 a What is design? Describe the difference between conceptual design and technical design. [L2][CO3] [5M]  
b What is modularity? List the important properties of a modular system. [L1][CO3] [5M]
- 3 a Discuss the objectives of software design. How do we transform an informal design to a detailed design? [L6][CO3] [5M]  
b What is module cohesion? Classify different type of module cohesion. [L4][CO3] [5M]
- 4 a Define module coupling and explain different types of coupling. [L1][CO3] [5M]  
b If a module has logical cohesion, what kind of coupling is this module likely to have with others? [L1][CO3] [5M]
- 5 a Discuss object-oriented software design approach. [L6][CO3] [5M]  
b Describe the various strategies of design. Which design strategy is most popular and practical? [L2][CO3] [5M]
- 6 a Explain function-oriented software design approach. [L1][CO3] [5M]  
b Demonstrate relationship between module cohesion and module coupling for process of good software design. [L1][CO3] [5M]
- 7 The following parameters for basic and logarithmic poisson models are given: [L6][CO3] [10M]

<b><i>Basic execution time model</i></b>	<b><i>Logarithmic poisson execution time model</i></b>
$\lambda_0=10$ failures/CPU hr.	$\lambda_0=30$ failures/CPU hr.
$V_0=100$ failures	$\theta=0.025$ /failure

- i) Determine the additional failures and additional execution time required to reach the failure objectives of 5 failures/CPU hr for both models.  
ii) Repeat this for an objective function of 0.5 failure/CPU hr. Assume that we start with the initial failure intensity only.
- 8 What is software quality? Discuss software quality attributes. [L1][CO3] [10M]
- 9 Explain the following software reliability models. [L2][CO3] [10M]  
i) Basic Execution Time Model  
ii) Calendar Time Component Model.
- 10 Discuss the difference between object oriented designs and function oriented design. [L6][CO3] [10M]

**UNIT –IV**  
**SOFTWARE TESTING**

- |           |   |           |       |
|-----------|---|-----------|-------|
| <b>1</b>  | <p><b>a</b> What is software testing? What is the difference between verification and validation</p>  | [L1][CO4] | [4M]  |
|           | <p><b>b</b> Define the following terminologies:<br/>i) Error, Mistake, Bug, Fault and Failure.<br/>ii) Test, Test case and Test suite.</p>  | [L1][CO4] | [6M]  |
| <b>2</b>  | <p>What is the difference between<br/>(i) Alpha testing &amp; beta testing<br/>(ii) Functional &amp; structural testing</p>   | [L2][CO4] | [10M] |
| <b>3</b>  | <p>Discuss various types of functional testing techniques.</p>  | [L5][CO4] | [10M] |
| <b>4</b>  | <p><b>a</b> Consider a program for the determination of the nature of roots of a quadratic equation. Its input is a triple of positive integers (say a,b,c) and values may be from interval [0,100]. The program output may have one of the following words.<br/>[Not a quadratic equation; Real roots; Imaginary roots; Equal roots]<br/>Design the boundary value test cases.</p>                                   | [L6][CO4] | [5M]  |
|           | <p><b>b</b> Explain the boundary value analysis testing techniques with the help of an example.</p>   | [L2][CO4] | [5M]  |
| <b>5</b>  | <p><b>a</b> Illustrate Equivalence class testing technique.</p>   | [L2][CO4] | [5M]  |
|           | <p><b>b</b> Consider a program for the determination of the nature of roots of a quadratic equation. Its input is a triple of positive integers (say a,b,c) and values may be from interval [0,100]. The program output may have one of the following words.<br/>[Not a quadratic equation; Real roots; Imaginary roots; Equal roots]<br/>Identify the equivalence class test cases for output and input domains.</p> | [L6][CO4] | [5M]  |
| <b>6</b>  | <p>Elaborate various types of structural testing technique.</p>   | [L5][CO4] | [10M] |
| <b>7</b>  | <p><b>a</b> Explain decision table based testing technique.</p>   | [L2][CO4] | [5M]  |
|           | <p><b>b</b> Simplify data flow testing technique with an example.</p>   | [L2][CO4] | [5M]  |
| <b>8</b>  | <p><b>a</b> What is the purpose of integration testing? How is it done?</p>   | [L1][CO4] | [5M]  |
|           | <p><b>b</b> Differentiate between integration testing and system testing.</p>   | [L4][CO4] | [5M]  |
| <b>9</b>  | <p><b>a</b> What are the objectives of testing? Why is the psychology of a testing person important?</p>  | [L1][CO4] | [5M]  |
|           | <p><b>b</b> Summarize an effect graphing testing technique.</p>   | [L2][CO4] | [5M]  |
| <b>10</b> | <p><b>a</b> Explain mutation testing technique.</p>   | [L2][CO4] | [5M]  |
|           | <p><b>b</b> Compare various debugging technique.</p>  | [L2][CO4] | [5M]  |

**UNIT –V**  
**SOFTWARE MAINTENANCE**

<b>1</b>	<b>a</b> Define the following teams: i) Software maintenance ii) Reverse engineering iii) Regression testing <b>b</b> Differentiate between re-engineering and new development. <b>c</b> Identify the importance of software maintenance.	[L1][CO5]	[3M]
<b>2</b>	Explain the phases of software maintenance with help of a diagram.	[L2][CO5]	[4M]
<b>3</b>	What is software maintenance? Describe various categories of maintenance. Which category consumes maximum effort and why?	[L4][CO5]	[3M]
<b>4</b>	Discuss Reverse engineering and Re-engineering.	[L5][CO5]	[10M]
<b>5</b>	What is regression testing? Differentiate between regression and development testing.	[L2][CO5]	[10M]
<b>6</b>	List out system documentation and also explain their purpose.	[L1][CO5]	[10M]
<b>7</b>	<b>a</b> Explain the following software maintenance. i) Quick fix model ii) Iterative enhancement model <b>b</b> What are the appropriate reverse engineering tools? Discuss any two tools in detail.	[L2][CO5]	[5M]
<b>8</b>	<b>a</b> What is reverse engineering? Discuss levels of reverse engineering. <b>b</b> What are configuration management activities? Draw the Performa of change request form.	[L1][CO5]	[5M]
<b>9</b>	Identify various software maintenance models and explain in details.	[L6][CO5]	[5M]
<b>10</b>	<b>a</b> Classify different categories of software documentation. <b>b</b> Compare New software development and Re-engineering	[L1][CO5]	[5M]
		[L4][CO5]	[5M]

**Preparedby:**

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