

Important Questions for Software Engineering -- Chander Kant

1.
What are the importance of software development life cycle model ? Explain the working of the following software development models :
(1) Iterative waterfall model.
(2) Prototype model.
(3) Spiral model.
Which is more important? Why?

2.
What is the aim of software engineering? What does the discipline of software engineering? Discuss.

3.
What are software metrics ? List the various types of software metrics used for estimating software size? Also enumerate merits and demerits of each of these.

4.
Draw flow graph and hence find McCabe cyclomatic complexity of a program in C for determining roots of quadratic equation.

5.
How a fault is different from a failure ? In any software development effort, why it is advantageous to detect defects in the same phase in which they are introduced?

6.
For the following C Program estimate Halsted's length and volume measures program to calculate G.C.D. of two no.

```
int gcd(x,y);
int x,y;
{
  if(x > y) then
    x=x-y;

  else
    y=y-x;
  return x;
}
```

(b)Mention five important skills and traits of a good software engineer.

7.
(a) Explain briefly Putnam Model. What are limitations of this model?

(b) Discuss why the no. of engineers required for a software project cannot be calculated as a simple dividing of the effort estimate (in PM) by the nominal time estimate (in months) ?

(c) How is Cyclomatic Complexity useful in testing?

8.
You have estimated the nominal development time of a moderate sized software product to be one yr. You have also estimated that it will cost 0.5 lac to develop the software project. Now the customer comes tell you that he wants you to accelerate the development by 10%. How much additional cost would you change for this accreted delivery?

(b)
Define function points. Compare LOC and FP metrics. Compute the function points for a project for the following characteristics :
No. of using inputs : 40
No. of using outputs : 2 times of inputs.
No. of enquires : ½ times of outputs.
No. of files : Nil
No. of external interfaces : 02
Assume all complexity factors are average.

9.

Explain the concept of black-box testing and white box testing. What are the different black-box and white-box testing techniques?

- 11.
- What problems are likely to arise if two modules have high coupling?
 - What problems are likely to arise if one module has low cohesion?
 - Enumerate the different types of coupling between two modules and different types of cohesion between a module.

12.

Define the term Software Engineering. Explain the major differences between software engineering and other traditional engineering.

What is Prototyping? In what types of applications it should be used? How does it differ from waterfall model? Also explain its advantages and disadvantages over water fall model.

- 13
- Discuss the principles that may be useful in software development , and show they are related .
- What is meant by " Software quality and productivity " briefly describe the various factors which influence quality and productivity of a software product.
 - Which is more important- The product or The process? Justify your answer.

14. (a)
- As we move outward along the process flow path of the spiral model. What can we say about the software that is being developed or maintained?
- What is software complexity? List and explain the various factors responsible for software complexity? Illustrate through suitable examples
 - What are the rules used for deriving a Gantt chart from a PERT chart, and vice-versa? How complete are our rules ? Explain ?

- 15 (a)
- What is software crisis ? State its significance in reference to software engineering discipline.
- What is meant by cost estimation? What are the main factors used in cost model Name the best model for cost estimation and also provide its overview.
 - Is it possible to estimate software size before coding? Justify your answer with suitable examples.

- 16 (a)
- What are software metrics? List the various types of software metrics and outline purpose of each. Also enumerate merits and demerits of software metrics.
- What is software failure ? Explain necessary and sufficient condition for software failure? Mere presence of faults means software failure. Is it true? If not , explain through an example such a situation in which a failure will definitely occur.
 - What is module-coupling? What are the different types of module-coupling? Briefly explain each of these and their relevance.

17. (a)
- What is meant by software reliability? Illustrate through an example that how it is relative term. Also describe cost reliability relationship briefly.
- What is the difference between software verification and validation? Describe the importance of each of the software development process. Also enumerate few important verification and validation techniques.

- 18 (a)
- How do object oriented Design (OOD) and structured design differ? What aspects of these two design methods are the same?
- Why is completeness more difficult to achieve as abstraction level increases and why must interactivity increases if completeness is to increase?
 - What do you understand by software maintenance? What are the various types of maintenance? When it starts and why it is costly? Also explain various measures through which it can be minimized.

- 19(a)
- What is a COCOMO Model ? Discuss various types of COCOMO models and also explain phase-wise distribution of effort.
- Differentiate between Coupling and Cohesion, and enumerate the different types of coupling between two modules and different types of cohesion between a module .

- 20(a)
- What is meant by software Testing ? Briefly discuss various types of testing technique ? Is there any testing technique that guarantees that the programme is 100 % correct . justify your answer.
- What do you understand by the term life-cycle model of software development? Why is it important while developing large software product? Explain?

- 21 (a)
- What is meant by the term SOFTWARE QUALITY? Why is getting much much attention now a days? Explain various McCall's S/W quality parameters.

(b) How is fault different from failure? In any software development effort why is advantageous to detect defects in same phases in which they are introduced?

22.

What is Risk analysis? Outline the major risk in a software project. What are various possible ways to abate the risk of cost and schedule overruns?

23.(a) What is software reliability? How does software reliability attribute towards software quality? Also describe cost reliability relationship.

24. (a) What are software metrics? List the various types of software metrics used for estimating software size . Also explain merits and demerits of each of these.

25. (a) What do you understand by cyclomatic complexity? How it is determined what it depicts?

(b) Why does software fail after it has passed Acceptance Testing? Explain?

(c) What problems are likely to occur if one module has low cohesion? Explain?

26.

(a) Define and explain the following terms :

Software crisis.

Software engineering

What is Waterfall model? Explain its advantages and disadvantages.

What are function points? Explain the relevance of function point analysis.

27 (a)

What is software project planning? List and discuss various points which one must keep in mind while planning a software project.

(b) What is cost estimation? List various cost estimation models and illustrate one important cost estimation model of your choice. Also discuss the fundamental limitation of cost estimation.

28 (a) What is software evolution? Discuss some evolution techniques.

(b) Is it possible to estimate cost of a software size before coding? Justify your answer with suitable examples.

(c) What is software quality? Outline various software quality parameters.

29.(a) What is relation between software quality and productivity? Briefly describe various factors which effect quality and productivity of a software project.

(b) Discuss the principles of software engineering.

30(a)

What are software metrics? List the various types of software metrics and outline the purpose of each. Also enumerate merits and demerits of software metrics.

(b) What is a good software design? Outline important characteristics of a good design? Also discuss various software design approaches.

31

(a) What is SRS document? What are characteristics of a good SRS document?

(b) Difference between following along with illustration :

(1) Coupling and cohesion.

(2) Unit testing and integration testing.

32. (a) What is software reliability? Explain how software reliability is related to:

1. Failure intensity.

2. Hardware reliability.

(b) What is Risk Analysis? List the major risks in a software project. What are possible ways to abate the risks of cost and schedule overruns?

33 (a) What is meant by documentation? State its significance if project systems.

(b) What are the major methods for verifying a design ? If the design is expressed in formal language, can an automated tool help in verification , and in what manner?

(c) What are the characteristics of a good software reliability model? What are the assumptions and limitation of the current reliability models?

(c) What is difference between s/w reliability and h/w reliability?

Software Reliability

What are the various reliability metrics? Explain which is more effective? Why?

Explain the working of the following reliability models:

1. Any one finite failure model.

2. Any one infinite failure model.

What are the assumptions and limitation of reliability models?

(c) Should reliability take precedence over efficiency ? If yes , then justify it with suitable reasons.