1. Compare the relative advantage of using the iterative waterfall model and the spiral model of software development. Explain with the help of examples, the type of problems for which you would adopt the waterfall model of software development, and the type of problems for whichyou would adapt the spiral model.

2. What do you mean by software lifecycle model(s)? is it compulsory to follow it whiledeveloping a project? Explain in brief.
3. Show how the failure curve of software differs from that of hardware. Software doesn't wear out but it deteriorates due to change. Justify. How do software myths affect a softwareproject?
4. What do you mean by software process models? Why we need it? Distinguish between software product and software process. Name four process models that are used to develop large software systems.
5. If members of the software team are to drive the characteristics of the process that is applied to build software, mention the key traits that must exist among the people on an agile team and the team itself.
6. Define the roles in Scrum? Explain Agile software development process in detail. Differentiate between Scrum and Sprint.
7. Define "requirement engineering". How does the domain knowledge help in requirement analysis? What are the underlying principles that guide analysis work? Why is it difficult to gain a clear understanding of what the customer wants?
8. What do you understand by work breakdown in project management? Why is work breakdown important to effective project management? How is work breakdown achieved? What problems might occur is tasks are either broken down into too fine a granularity or tasks are broken into too coarse granularity?
9. What are the different categories of software development projects according to the COCOMO estimation model? Give an example of software product development projects belonging to each of these categories.
10. Discuss the important ways in which a well formulated SRS document can be useful to various stakeholders.
11. Design test case for login functionality (invalid login, forgot password and lockaccount

after 3 attempts)

i. Draw context and DFD for BookMyShow application which includes ticket sales for movies, plays and corrects.
ii. Draw a Sequence Diagram, DFD, Activity, User Interface Diagram for Food Ordering System in a restaurant.
iii. Develop an E-R diagram, Sequence Diagram, DFD and prepare Data Dictionary for Hospital Management System.

12. What does win-win mean in the context of negotiation during the requirements engineering activity?

13. Compare Coupling and Cohesion. Explain different types of Coupling and its effectson software modules
14. Compare the relative advantages of function oriented and object-oriented approachesto software design.
15. What is cohesion and coupling? Explain the classification of cohesion and coupling
16. List out the different characteristics of good UI design. List the desirablecharacteristic that a good user interface should possess.
17. What is the significance and importance of CMM certification for any software organization? Is it possible for an organization to achieve higher level of CMM without achieving a lower one? Justify.
18. Explain the importance of software configuration management in modern quality paradigms such as SEI CMM and ISO 9001. An organization not using any configuration management tool can qualify for which SEI CMM level(s)?
19. What is software testing and why is it required? Explain the general guidelines for performing software testing? Differentiate between Black-Box testing and Structural (White-Box) Testing. What are the types of White-Box testing? Explain the step by step procedure to calculate the cyclomatic complexity.
20. Distinguish between error and failure in terms of Software Defect? Which of the two is detected by Software testing? Justify your answer. Is it possible to test the software exhaustively? Justify your answer. Can anyone guarantee that the product delivered is 100% error free even after thorough testing?
21. Give examples of defects that you would be able to detect during code inspection and code

walk through. Why is it advantageous to detect as many errors as possible during code review than during testing?

22. Which are the activities performed by Quality Assurance (QA) Department? Briefly explain.

23. What do you mean by software maintenance? What are the different types of maintenance that a software product might need?

24. Explain the concept of Component based Software engineering (CBSE). What are the essentials? What are the design principles?

25. List out the types of software risks? What are the risk identification and risk avoidance?

26. What do you mean by Configuration Management? How does it help to ensure high quality of a software product? What are the different types of documents that need to be developed or produced?

Numeric and diagram-based questions

27. Assume that the size of an organic type software product has been estimated to be 60,000 lines of source code. Assume that the average salary of a software developer is Rs. 20,000 per month. Determine the effort required to develop the software product, the nominal development time, and the cost to develop the product

28. A store is in the business of selling paints and hardware items. A number of reputed companies supply items to the store. New suppliers can also register with the store after providing necessary details. The customer can place the order with the shop telephonically. Or personally. In case items are not available customers are informed. The detail of every new customer is stored in the company's database for future reference. Regular customers are offered discounts. Additionally, details of daily transactions are also maintained. The suppliers from time to time also come up with attractive schemes for the dealers. In case, scheme is attractive for a particular item, the store places order with the company. Details of past schemes are also maintained by the store. The details of each item i.e. item code, quantity available etc. is also maintained.
    • Draw a level 1 DFD and Use case for the above requirement

29. Draw a class diagram using the UML syntax to represent the following aspects concerning a library.
    An issuable can either be a book or a CD. Books can be either reference books or text books. The details of various issuable are maintained in a register called the issuable register. The library has many members whose details are maintained in a member register. A member can issue upto 10 text books for a month. A member can also issue two CDs for a week.

30. Draw a class diagram using the UML syntax to represent the fact that an order Register consists of many orders. Each order consists of up to ten order items. Each order item contains the name of the item, its quantity and the date by which it is required. Each order item is described by an item order specification object having details of an order item such as its unit price, name and address of the manufacturer, and the warranty period and terms of warranty.
31. Design the black-box test suite for a function that takes the name of a book as input and searches a file containing the names of the books available in the Library and displays the details of the book if the book is available in the library otherwise displays the message "book not available".

32. Consider the following program segment.

```
Int temp
If(a>b)temp=a
Else temp=b
If(c>temp)
Temp=c
Return temp
```

1) Draw the control flow graph for this program segment.
2) Determine the cyclomatic complexity for this program. (Show the intermediate steps in your computation. Writing only the final result is not sufficient).

32. Compute function point value for a project with the following domain characteristics:

No. of I/P = 40

No. of O/P = 50

No. of user Inquiries = 24

No. of files = 8

No. of external interfaces = 2

Assume that all the complexity adjustment values are average.

33. Draw the control flow graph for the following function named find maximum. From the control flow graph, determine its cyclomatic complexity.

```
int find-maximum (int i,int j, int k){
int max;
if(i>j) then
if(i>k) then max=i;
else max=k;
else if(j>k) max=j
else max=k;
```

```
return(max);
}
```

34.Compute function point value for a project with the following domain characteristics:

No. of I/P = 30

No. of O/P = 62

No. of user Inquiries = 24

No. of files = 8

No. of external interfaces = 2

Assume that all the complexity adjustment values are average.

35.Suppose you are developing a software product in the organic mode. You have estimated size of the product to be about 1, 00,000 lines of code. Compute the nominal effort and development time.

36. Assume that the size of an organic type software product has been estimated to be 52,000 lines of source code. Assume that the average salary of a software developer is Rs. 20,000 per month. Determine the effort required to develop the software product, the nominal development time, and the cost to develop the product.

37.

Consider the following program segement.

```
int find-maximum(int i,int j, int k)
{
        int max;
      if (i>j)  then
            if ( i>k)   then max=i:
                  else max=k:
           else   if (j>k)  max=j
                       else max=k:
        return (max) :
}
```

1. Draw the control flow graph for this program segment.
2. Determine the cyclomatic complexity for this program. (Show the intermediate steps in your computation . Writing only the final result is not sufficient)
3. How is the cyclomatic complexity metric useful in the testing process?

38. Draw a control flow graph and find Cyclomatic Complexity for given code.

insertion_procedure (int a[], int p [], int N)

```
{
(1) int i,j,k;
(2) for ((2a)i=0; (2b)i<=N; (2c)i++)
(3) p[i] = i;
(4) for ((4a)i=2; (4b)i<=N; (4c)i++)
   {
    (5) k=p[i];j=1;
    (6) while (a[p[j-1]] > a[k]) {(7)
    p[j] = p[j-1];
    (8) j--
   }
(9) p[j] = k;
}}
```