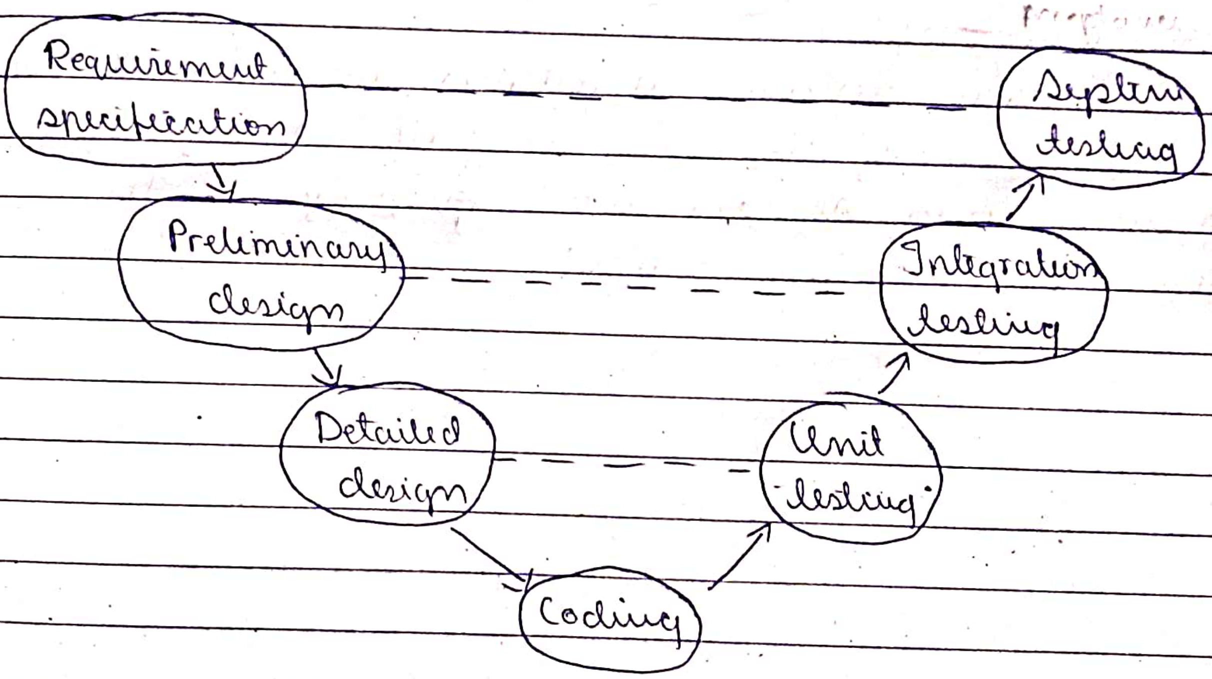
1. With a neat diagram explain levels of testing

Software Testing is an activity performed to identify the errors so that the errors can be removed to obtain a product of higher quality

There are different levels of testing.

1. Unit testing
2. Integration testing.
3. System testing
4. Acceptance testing



1 Unit testing:

In this type of testing, errors are detected individually from every component or unit by testing them and removing the errors and ensure they are fit to be used by developers.

2 Integration testing

In this testing, two or modules which are unit tested and are integrated to test and verify if the integrated modules work as expected and interface errors are also detected

3. System testing:

In system testing, complete and integrated softwares are tested i.e, all the system elements forming the system is tested

4 Acceptance testing

In this testing, it ensures whether all the requirements of the user is fulfilled before its delivery and software works properly in the user's working environment

2 Define software quality. Explain different measures of software quality

Software quality is defined as the ability of the software to function as per the user requirement.

Types of software quality attributes

1 Static:

structured, maintainable, testable code as well as the availability of correct and complete documentation

2 Dynamic:

completeness, consistency, usability and performance.

Completenes: refers to the availability of all features in the requirement or in user manual. An incomplete software is the one that has not implemented all the features

Consistency - refers to a common set of conventions and assumptions.
Ex: In user interface, all the buttons are of same color coding convention
Ex of inconsistency would be when a database application display DOB of a person in database.

Usability - there exist many techniques for usability testing.

Performance - It is a non functional requirement It refers to the time the application takes to perform a requested task.

3. Explain the perspective testing definitions of the following.

Error- people make error, when writing a program when people make mistakes, these mistakes are called bugs

Fault: A fault is the result of error i.e, it is variation in the code that causes failure

Failure: It occurs when the code corresponding to the fault executes

Incident: It is an unplanned event that requires further investigation.

Test. It is mainly concerned with error, fault, failure, incident. A test has two distinct goals: to find the failure or to demonstrate correct execution

Test case: group of condition - tester determines whether a software is working as per the requirement.

4 Write the pseudocode for structured programming version of traingular problem.

```
Program triangle2
Dim a,b,c As Integers
Dim IsATriangle as Boolean
Step1 Get Input
Output("Enter 3 integers which are sides of
            triangle")
Input(a,b,c)
Output("Side A is", a)
Output("Side B is", b)
Output("Side C is", c)

Step2: IsATriangle?
If (a<b+c) AND (b<a+c) AND (c<a+b)
    Then IsATriangle=True
    Else IsATriangle=False
EndIf

Step3: Determine triangle type
If IsATriangle
    Then If (a=b) AND (b=c)
        Then Output("Equilateral")
        Else If (a≠b) AND (b≠c) AND (c≠a)
            Then Output('Scalene")
            Else Output("Isosceles")
            EndIf
        EndIf
    Else Output('Not a triangle')
EndIf
End triangle2
```

5 Write the pseudocode for next date problem

```
Program NextDate
Dim tom_month, tom_day, tom_year As Integers
Dim month, day, year As Integers
Output ("Enter the date" in the form of MM-DD-YY
Input (month, day, year)
Case month of

Case 1 : month is 1,3,5,7,8 or 10 : 31 days month
                                   (except Dec)
    if day < 31
      then tom_day ~~+=1~~ = day + 1
    else
        tom_day = 1
        tom_month = month + 1
    endIf

Case 2 : month is 4, 6, 9, 11 : 30 day month
    if day < 30
      then tom_day = day + 1
    else
        tom_day = 1
        tom_month = month + 1
    endIf

Case 3 : month is 12 : December
    if day < 31
      then tom_day = day + 1
      else
        tom_day = 1
        tom_month = 1
```

```
            if year = 2012
                Then Output ("2012 is over')
                else tom_year = year + 1
        endif

    Case 4: month is 2: February
        If day < 28
            Then tom_day = day + 1
            ~~else~~ if day = 28
                then if ((year is a leap year))
                    then tom_day = 29
                    else 'not a leap year
                        tom_day = 1
                        tom_month = 3
                    endif
            if day = 29
                then if ((year is a leap year))
                    then tom_day = 1
                         tom_month = 3
                    else 'not a leap year
                        Output ("Cannot have feb", day)
                    endif
            endif
        endif
    endif
    EndCase.
    Output ("Tomorrow's date is", tom_month,
            tom_day, tom_year)
    End NextDate
```

6. Explain different types of software metrics in detail.

1. Process metrics
2. Product metrics
3. Project metrics

1. Process metrics.

Process metrics are used to define characteristics and execution of the project. The characteristics are essential to the improvement and maintenance of the process in SDLC.

2. Product metrics:-

Product metrics define the size, quality, complexity of the product. With the help of these characteristics, developers can improve quality of software.

3. Project metrics:

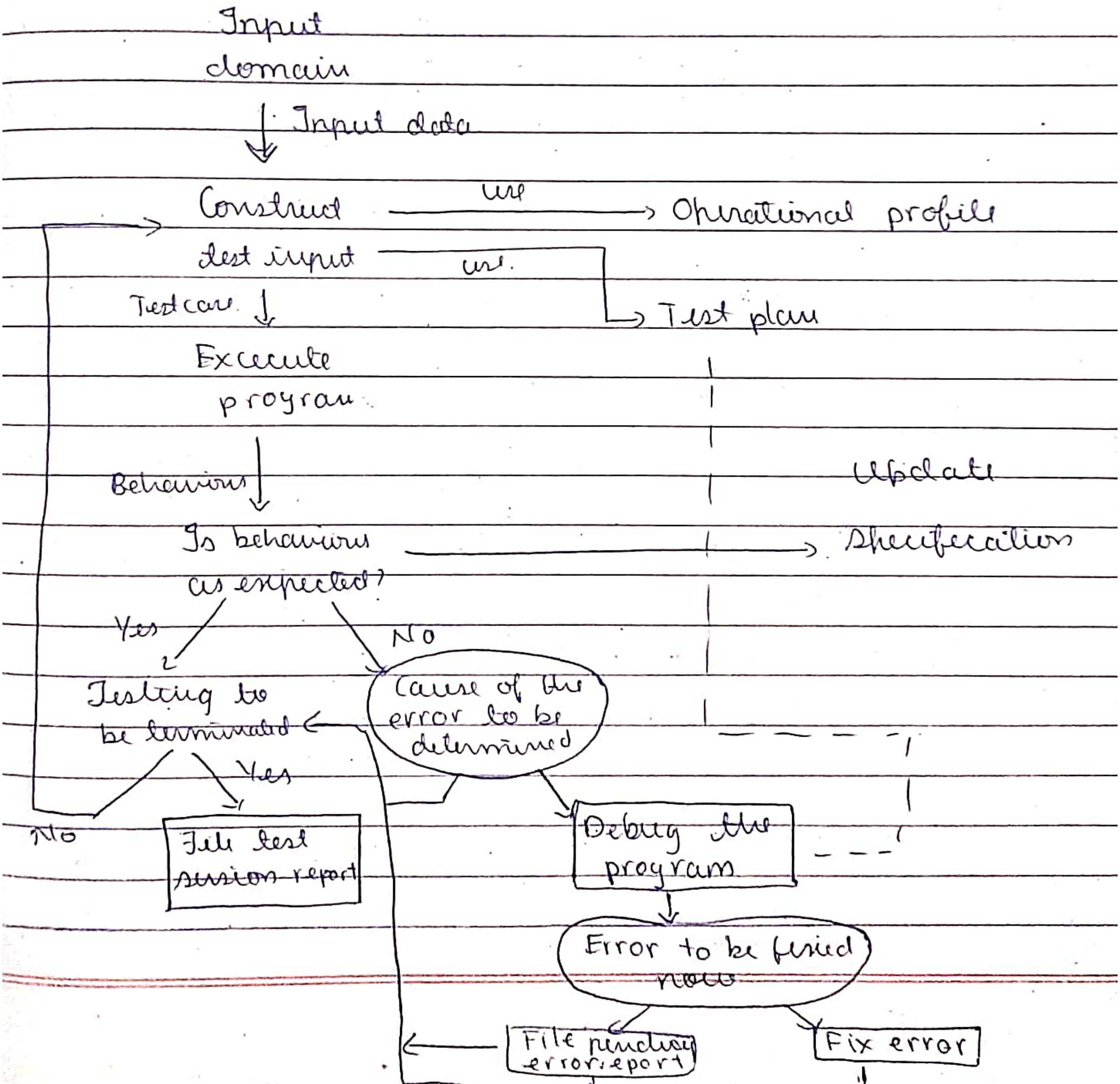
Project metrics determine the overall quality of the project. It is used to calculate the cost, productivity, defects and estimate the resource.

7. Explain functional testing and structural testing.

Structural	Functional
• Structural testing is done in manual mode	• Functional testing can be done either automatically or manually.
• Structural test case are based on input/output condition	• Functional test cases are based on actions that a component can perform
• Structural testing is done after the coding process is completed by maintence group	• Functional testing is done during development and/or maintenance
• Structure test cases donot depend on data values	• Functional test cases may have to use some specific value for test case to pass or fail.
• They are based on hardware level error checking	They are achieved by software ~~testing~~ level error checking.
• It involves static data structure	It involves dynamic data structure
• Main focus on logical errors or bugs in the code	Focus on verifying that system meets the requirement

Structural testing is performed on low level modules.	It is performed on the entire software
It is carried out by a software development group	Functional test cases are designed by business analysts or testers

8. With the help of test and debug cycle diagram, explain testing and debugging process.



Input domain
Input data
Construct test input
use
Operational profile
use.
Test plan
Test case
Execute program
Behaviours
Update Specification
Is behaviours as expected?
Yes
No
Testing to be terminated
Cause of the error to be determined
Yes
No
File test session report
Debug the program
Error to be fixed now
File pending error report
Fix error