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| USN | | | | | | | | | | |  | | |
| Internal Assessment Test 3 – July 2024 | | | | | | | | | | | | | |
| Sub: | Software Engineering and Project Management | | | | | Sub Code: | 21CS61 | Branch | ISE | | | | |
| Date: | 30/07/2024 | Duration: | 90 min's | Max Marks: | 50 | Sem/Sec: | VI / A, B & C | | | OBE | | | |
| Answer any FIVE questions | | | | | | | | MARKS | CO | RBT | | | |
| 1 | (a) Define the term Project Bidding. (b) Explain the different types of project bidding techniques - RFP, RFQ, RFI, and RFT. | | | | | 2 8 | | CO4 | L2 | | | | |
| 2 | (a) What is a software quality model? (b) Discuss Boehm's quality model with a proper diagram. | | | | | 2 8 | | CO4 | L2 | | | | |
| 3 | (a) What is a PSP model? (b) Discuss the techniques to enhance software quality. | | | | | 5 8 | | CO4 | L2 | | | | |
| 4 | (a) What is a reliability growth model? (b) Discuss Jelinski and Moranda's Model, Littlewood and Goel-Okutomo's model in detail. | | | | | 2 8 | | CO41 | L2 | | | | |

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|---|--|--|--|--|--|--------|--|-----|----|--|--|
| 5 | (a) Differentiate between SEI CMM and CMMI software quality models. (b) Discuss the major external software quality characteristics and sub-characteristics of ISO 9126. | | | | | 4 6 | | CO4 | L2 | | |
| 6 | (a) What do you understand by the terms gold plating and scope creep? Explain the difference between these two and briefly explain why the project manager needs to guard against these. (b) Calculate the latent errors (the total number of errors) where reviewer A finds 40 errors and reviewer B finds 20 errors, of which 5 are common to both reviewers A and B. | | | | | 4 4 | | CO5 | L3 | | |

Solution

Q1. (a) Define the term Project Bidding.

(b) Explain the different types of project bidding techniques - RFP, RFQ, RFI, and RFT.

Ans 1.

IAT-03 (1)

D7P

1] a) Project Bidding

→ Project Bidding is a process where an organisation seeks for vendors for the project completion.

→ It's based on cost and skills.

b) There are 4 different ways

| | | |
|-----|---|-------------------------|
| RFP | → | Request for proposal |
| RFQ | → | Request for quotation |
| RFI | → | Request for information |
| RFT | → | Request for tender |

①
②
CMR
→ RFD

→ When used:

It is used when the organisation has the project details as well as solutions.

→ process

The organisation will ask the vendor to submit the required cost and other details.

→ Vendor's response

The vendor will reply with the details, cost and his capabilities.

→ Selection

The organisation will select the best project based on cost and details.

RFD and RFT are same.

→ RFT is used for few government projects where you will have to submit the tender fee before participating.

RFP

Right for proposal.

→ When used:
It is used when the organization has the project details but not the solutions.

Process:

→ The organization will ask the vendor to submit the proposals.

→ Vendor's response
The vendor will submit all the

possible solutions

→ Purpose

The organisation will wait until everyone submit their proposal, because they want the best solutions.

→ Next steps

Further information will be given and the best vendor is selected based on his proposal and cost.

* RFI

* Request for information

→ When used

It is used when the organisation do not have both project details as well as the solution.



process

The organisation will ask the vendors to submit both project details and solution.

Vendor's response

The vendor will submit his proposal as well as ~~information~~

Selection

The best vendor with best thought will be selected.

purpose

Vendor with best idea is selected because his creative and analytical skills are put to test.

- Q2. (a) What is a software quality model?
(b) Discuss Boehm's quality model with a proper diagram.

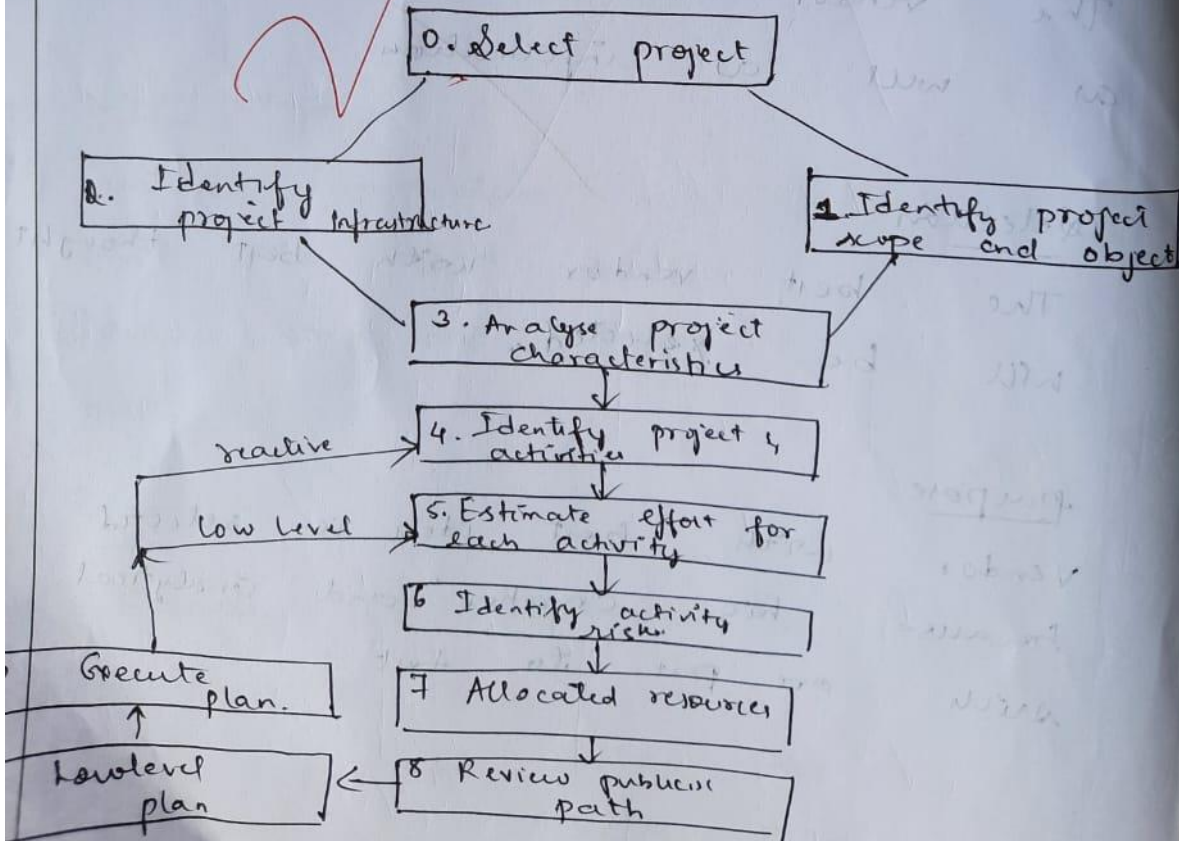
Ans 2:

(6)

2(a) Software quality model with step-wise analysis.

Quality is important in each and every step of the project.

In few specific parts it plays a crucial role.

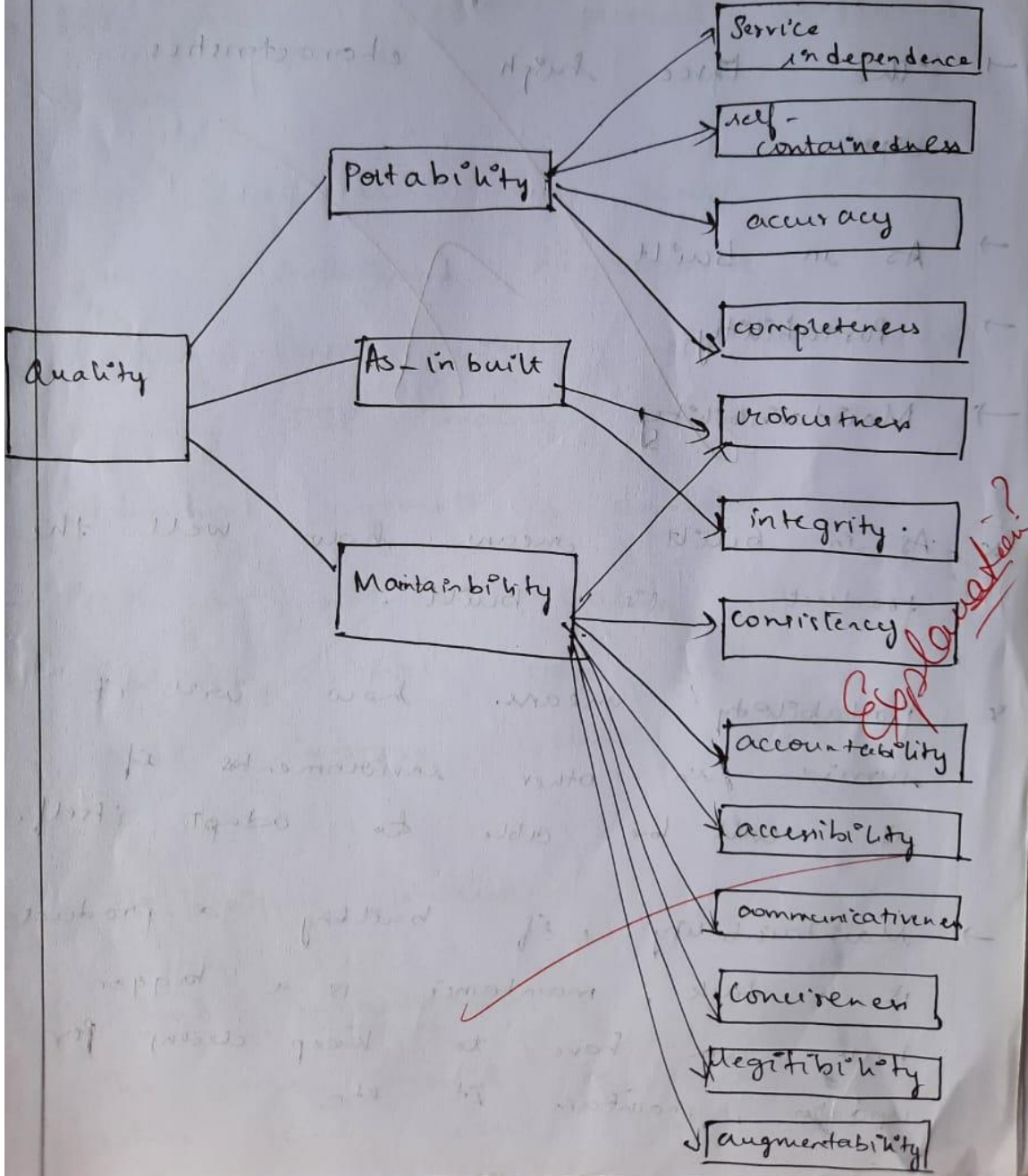


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Boehm's quality model



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Boehm's quality model is based on high characteristics

The three high characteristics are:

- As in built
- Portability
- Maintainability

* As in built means how well the product is built.

* portability means how well it survives in other environments if it will be able to adapt itself.

→ Maintainability, if building a product is a task, maintain is a bigger task we have to keep checking for updates, maintain it etc

a) PS
 PSP
 pro
 PS
 fo
 u
 a
 →
 b)

- Q3. (a) What is a PSP model?
(b) Discuss the techniques to enhance software quality.

Ans 3:

(9)

CMR

a] PSP model

- PSP stands for personal software process.
- PSP was built by Watts Humphrey for individual development. Unlike CMMI which was built for company, PSP mainly focuses on individual growth & development.
- PSP is not a coding or testing platform, here you can track and improve yourself.

Techniques include:

- * Time measurement
The time should be checked on where and what you are

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Spending.

- Sometimes boring tasks will take too long and interesting tasks might get over in a short time. Hence it is important to track the time.
- On tracking time you will become more productive.

PSP Learning

- Time spent on project development should be noted.
- The maximum, minimum or average number of code lines should be tracked because it will help in calculating the development time.

(8)

(11)



Perfect logs

Maintaining logs when you are performing tasks will be helpful for future planning of things.

Recording logs will help you learn from mistakes.

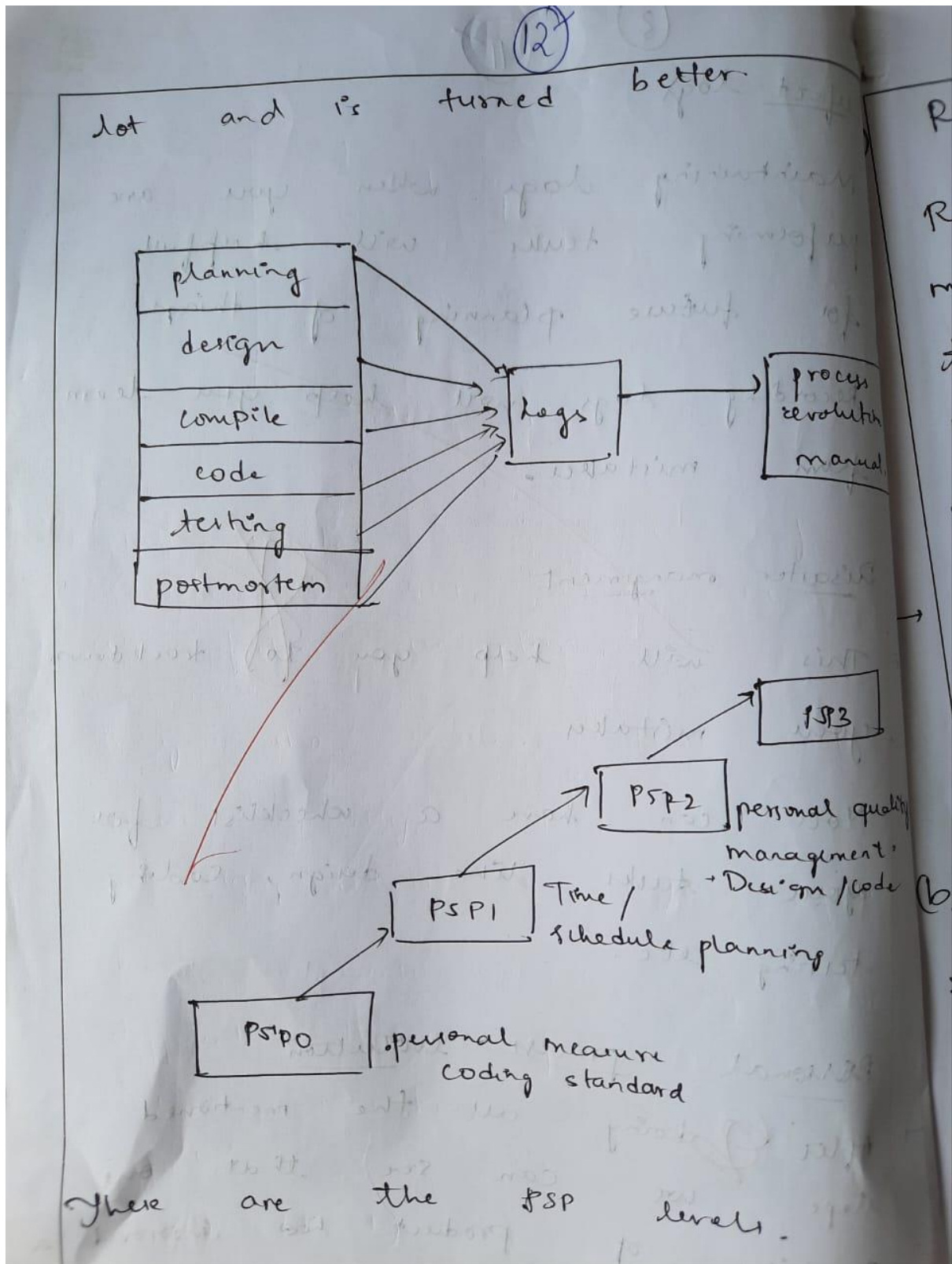
Disaster management

* This will help you to track down your mistakes.

* You can have a checklist for your tasks like design, coding, testing etc.

Personal process evolution

→ After ~~doing~~ all the mentioned steps we can see that our quality of product has improved a



- Q4: (a) What is a reliability growth model?
 (b) Discuss Jelinski and Moranda's Model, Littlewood and Goel-Okutomo's model in detail.

Ans 4:

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Reliability growth model

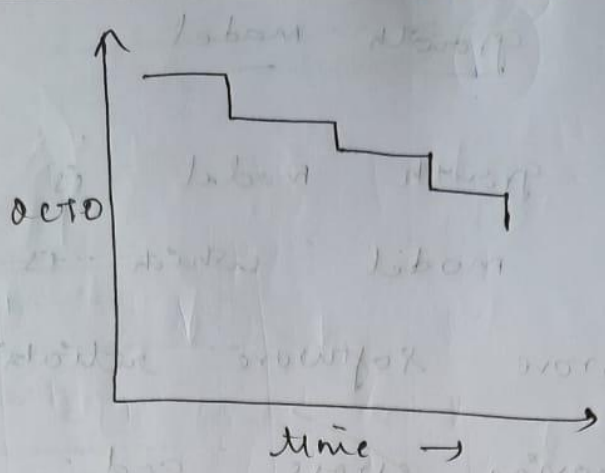
Reliability growth model is a mathematical model which is used to improve software reliability by removing errors and repairing them.

Reliability model can predict the level of reliability of a particular model.

Jelinski and Morand's model,

This is the simplest reliability model.

This is a step function model which seems like a staircase.



* The model is inclusive of zero perfect error which is a false assumption.

* They also assume that all errors equally reduce the reliability which is again false.

* Because each error may have different degree of error and will not have the same effect.

$$Z(1 - \frac{1}{N})^{N-1}$$

(4)

(15)



Littlewood

Negative reliability model.

It says that, as more errors are found more it will ~~be~~ reduce the reliability.

Reduced Dimension \rightarrow initial found error will reduce more reliability than the late found error

Gamma consideration \rightarrow It has static considerations to tell which error caused how much decrease in reliability

Goel Okamoto's model

It is an exponential reliability model.

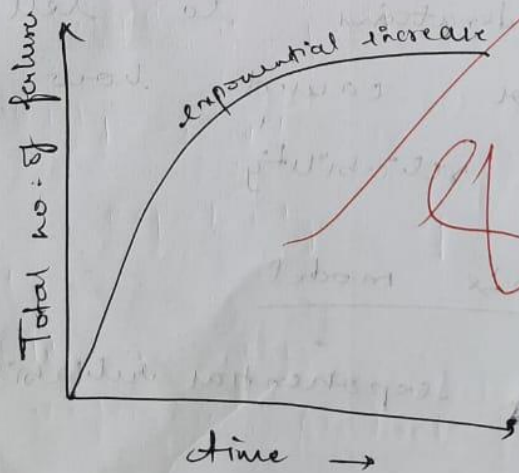
* It has non-homogeneous process i.e. NHPP.

* Cumulative failure. It gives the total number of failures.

* Formula is \Rightarrow

$$M(t) = N(1 - e^{-k \cdot t})$$

where N is the number of errors.



- Q5.** (a) Differentiate between SEI CMM and CMMI software quality models.
 (b) Discuss the major external software quality characteristics and sub-characteristics of ISO 9126.

Ans 5:

| <u>SEI CMM</u> | <u>CMMI</u> |
|---|--|
| → It stands for capability maturity model given by software engineering institute (SEI) | → It stands for capability maturity model integration. |
| → It is a framework | → It is the extended framework of the CMM |
| → It has staged only. | → It has staged and continuous. |
| → It can handle software development. | → It can do software development as well as system engineering. |
| → It has 5 levels * initial, repeatable, defined, managed and optimized. | → It also has 5 levels. initial, repeatable, defined and optimized. |

- 6) The Major external software characteristics are
- 1) Functionality
 - 2) Reliability
 - 3) Usability
 - 4) Efficiency
 - 5) Maintainability
 - 6) Portability

- * Functionality → covers the functional of the software product
- * Reliability → it can relate to the capability of the software product.
- * Usability → relate to the usability of software product
- * Efficient → relates how efficient the product is

Maintainability : relates how capable the product is.

Portability : relates how the product gets adapted to new environment.

Sub-characteristics define about the main characteristics.

Functionality

• Suitability

• Accuracy

• Interoperability

• Security

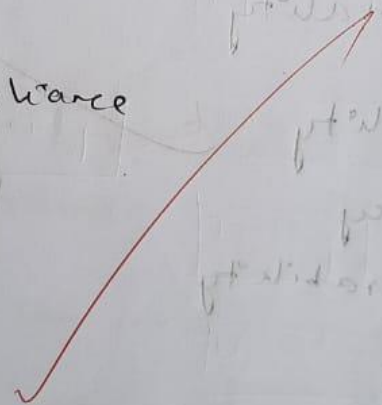
• functional compliance.

2) Readability

• Maturity

• Fault tolerance.

- Fault tolerance
- Readability compliance
- Usability
- Understandability
- Learnability
- Operability
- Attractiveness
- Usability compliance
- Efficiency
- Testing
- Resource
- Efficiency compliance
- Maintainability
- Analyzability
- ~~stability~~



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testing

Maintainability

compliance

portability

Co-existence

Adaptability

interactability

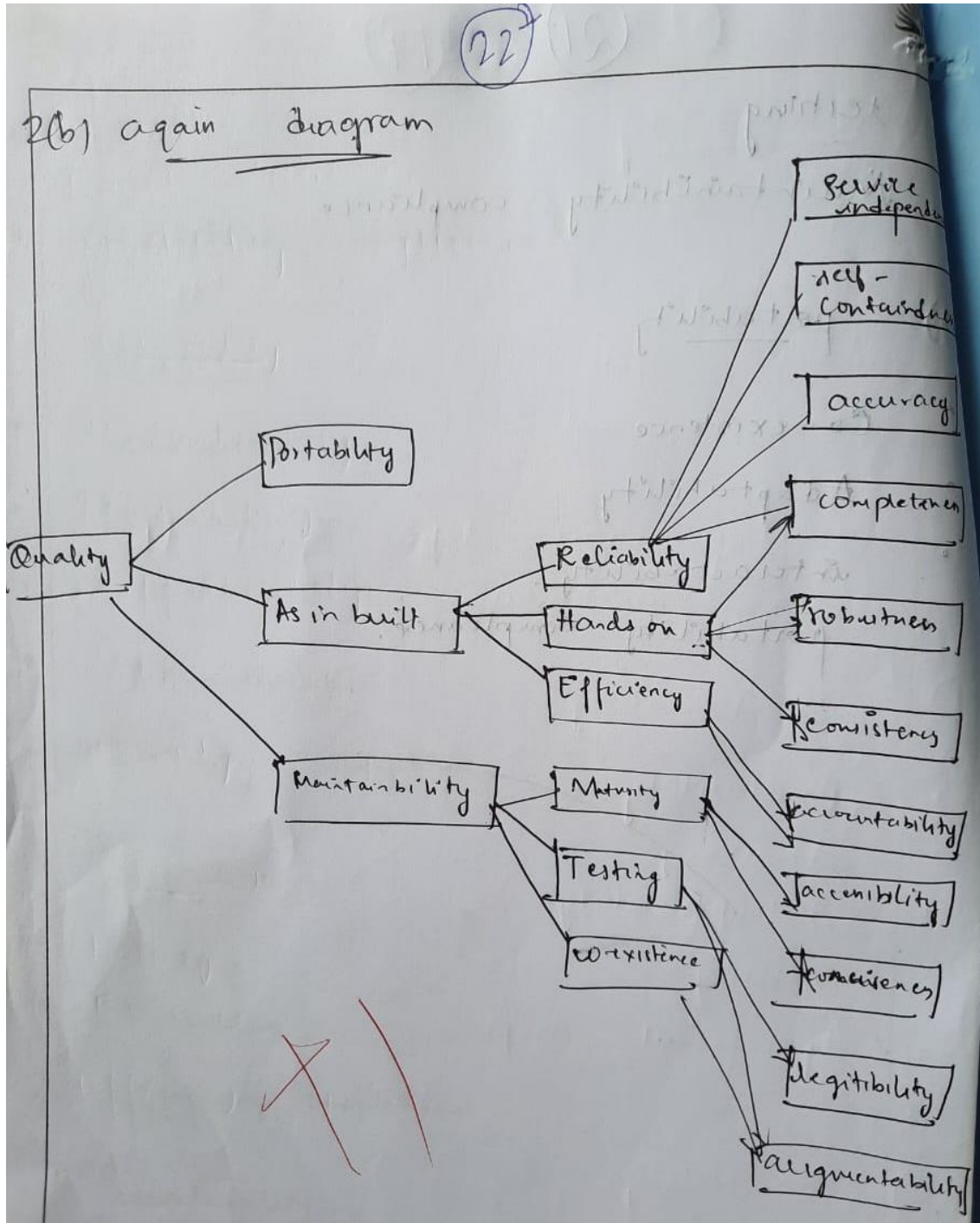
portability compliance

portability

portability

portability compliance

Ans 2b Continued :



*****End*****

