ROCOF = 26+27+12 / 10+7+1

= 65 / 240

= 0.271/hour

= 6.504/day ✓

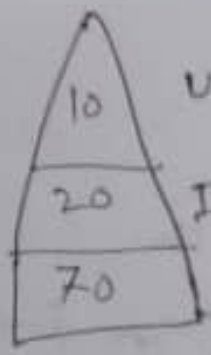
So we can summarize that

	actual	desired	verdict
availability	99.8%	≥ 99.8%	✓
POFOD	0.003	< 0.004	✓
ROCOF	6.504	< 7	✓

So yes my product meets the requirements given for release

based on Alpha and beta testing report, developers decide whether product should be improved or not.

System/UI tests in form lesser number than unit test. Standard ratio is



The main major is. system/UI test is much more complex than unit test, system/UI test sometimes done manually and this is very much time consuming. comparative unit test is simple and if unit works well then there is less chances that system/UI test will get error. so less number of system/ui test is enough

(For both product A and product B)

(b) model no:
- [illegible] (Error)
- valid (isvalid)
- null (Error)

manufacturer
- valid ~~(isvalid)~~ (if isvalid)
- null (Error)
- not exist in database (Error)

type
- valid ~~(isvalid)~~ (if isvalid)
- null (Error)
- not exist in database (Error)

sub type
- valid ~~(isvalid)~~ (if isvalid)
- null (Error)
- not exist in database. (Error)

(For Database)

Number of product
- 0 (Error)
- 1 (single)
- 10 (if isvalid = 1)
- >10 (if isvalid = 1)

number of type
- 0 (Error
- 1 (single)
- 10 (if isvalid = 1)
- >10 (if isvalid = 1)

which occurs during execution, this is the advantage of dynamic verification.

Disadvantage is it fails to catch those errors which occurs in static situation (no interaction situation

To get high quality software both static and dynamic verification needed

(b) CIA characteristics of secured system

(i) No unauthorized access to information.

(ii) Integrity: once something done it should remain same.

(iii) Non repudiation: User can't deny his/her action.

(iv) Identity checking for all users.

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ID No.: 0 1 1 2 0 1 0 3 9

Section: A

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Course Code: CSE 4495

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Name of Exam : Class Test / Mid-term / Final

Date: 13/09/2023

5

(a) Total number of specification in this case

= 3x2x2x2

= 24

Using combinatorial technique (2-way combination, the covering set:

Allow Cookies	Add-ons	Attack sites	Forgeries
Allow	yes	yes	yes
Allow	no	no	no
Restrict	yes	no	yes
Restrict	no	yes	no
Block	yes	yes	~~yes~~ no
Block	no	no	~~no~~ yes

10 minutes can serve

160 × 2 = 320 people

So if I choose option (ii) I can serve more customers and less customers face interruption.

So option (ii) is better.

1(b) Desired property

availability 99.8 %

ROCOF < 7 failures per day

POFOD less than 0.004

According to the given information

$$POFOD = \frac{26+27+12}{18759} = 0.003$$ ✓

$$availability = \frac{(24 \times 10 \times 60) - (12 \times 2)}{(24 \times 10 \times 60)}$$

$$= \frac{14400 - 24}{14400} = 0.998$$

$$= 99.8\%$$ ✓

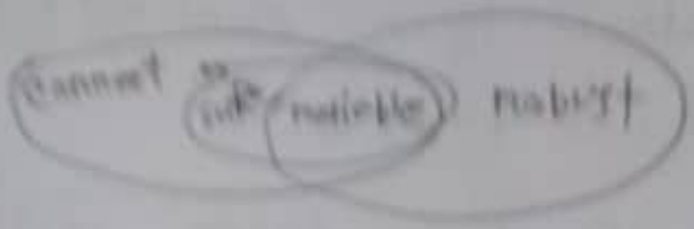
(e) Resilience testing check
- the system's strength, how
it can handle boundary
situation, how
it response, how it
comeback.

Types of acceptance testing

(i) Alpha testing: A group involve
of people
with development
team, after developing
a system those people
use the system
and give verdict.

(ii) Beta testing: The product
released to a
small group of
real users, they
use it in their
different environment
and give feedback.

Relationship between them:



2

1 a) customers engages during peak hours

960 - 1200 / hour

∴ 16 - 20 / minute

option (i) :

number of crash same : 3

downtime reduced to : 2 minutes
from 4 "

∴ total time saved

3 x 2 = 6 minutes

6 minutes can serve

96 - 120 people

option (ii) : 2 system outage
per week (1 outage reduced)

1 outage save 10 minutes
(total downtime time)

Q

(A) Two different ways of verification involves here is

(i) Static verification.

(ii) Dynamic Verification.

Advantage and disadvantage of Static verification: Static verification test systems static artifact, this is basically preventive method, interaction can hide error but in static verification no interaction occurs so it's easy to catch those error that hide during interaction.

disadvantage is this this time consuming and it fails to catch those errors which occurs during Interaction.

Advantage and disadvantage of dynamic verification: Dynamic verification is mostly done by automated tools, dynamic verification can catch those errors

9

10) For each choice identifying responses below:

(i) Model no:
- malformed
- valid
- null

(ii) Manufacturer:
- valid
- null
- not exist in database

(iii) Type:
- valid
- null
- not exist in database

(iv) Sub-type:
- valid
- null
- not exist in database

3

(a) Test oracle is a piece of code which compare expected and return value and give a verdict. AssertEquals function used in expected value oracle. There two oracles type oracle is implicit oracle and property based oracle.

(b)

For (i) property we need expected value oracle since it will check returned coordinate value with expected coordinate value.

For (ii) property we need property based oracle since it will check whether the response time < 200 ms or not. this is property checking.

1(c) ▲ Dependability of a system refers that system is correct, reliable, safe and robust.

Attributes of dependable system:

(i) Correct: The system is always consistent with it's specifications, always give correct output as expected.

(ii) Reliable: Correct behaviour from some period of observed behavior. Reliability can be measured.

(iii) Safe: Ability to avoid undesired situation/hazard. Hazard is defined so it can be verified.

(iv) Robust: Software that gracefully fails, it can encounter unforeseen or correct case.

Number of sub type
- 0 (Error)
- 1 (single)
- 10 (if isvalid=1)
- >10 (if isvalid=1)

(c) Total number of test case generating before

= 3×3×3×3×4×4×4 } if consider only one product
= 5184

or,

$3^8 \times 4^3$ } if consider A, B separately

= 419904

After applying constraint:

= 11 (Error) + 3 (single) + (isvalid=1)
(1×1×1×1×2×2×2) + (isvalid=0)0

= 22

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Invigilator's Signature with Date: A.4 (1.03.23)

Course Code: CSE 4495 Trimester / Semester: Spring / Summer / Fall 20 23

Name of Exam: Class Test / Mid-term 1 / Mid-term 2 / Final Date: 12/03/2023

(v) Number of product
- 0
- 1
- 10
- more than 10 (A large value)

(vi) Number of types
- 0
- 1
- 10
- >10

(vii) number of Sub-types
- 0
- 1
- 10
- >10

In this table I have covered all possible combination of any two column in the given table

(b) If I perform 3-way combinatorial testing then the size of the covering set will be

$= 3 \times 2 \times 2$

$= 12$ row and 4 colm

So there are more 6 combination in this than the previous one (2-way) one of them is ..

Allow cookies	Add-ons	Attack Sites	Forgeries
Allow	yes	no	no