CombineCS
The Extra Step

Software Engineering

DEC 2018 PYQs

RASHMI PRABHA

2018
20P48 July
Dec

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Q1) The Software Requirement Specification(SRS) is said to be __________ if and only if no subset of individual requirements described in it conflict with each other.

1. Correct
[✓ 2. Consistent]
3. Unambiguous
4. verifiable

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Q1) The Software Requirement Specification(SRS) is said to be ___________ if and only if no subset of individual requirements described in it conflict with each other.

1. Correct
2. Consistent
3. Unambiguous
4. verifiable

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1. SRS is said to be **correct** if it covers all the requirements gathered from end users that are actually expected from the system as output.
2. Requirements in SRS are said to be **consistent** if there are no conflicts between any set of requirements. Examples of conflict include differences in terminologies used at separate places.
3. An SRS is said to be **unambiguous** if all the requirements stated have only one interpretation, clear & concise.
4. An SRS is **verifiable** if there exists a specific technique to quantifiably measure the extent to which every requirement is met by the system or not.

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Q2) Which of the following statements is/are false ?

P: The clean-room strategy to software engineering is based on the incremental software process model.

Q: The clean-room strategy to software engineering is one of the ways to overcome “unconscious” copying of copyrighted code.

1. Both P & Q
2. Neither P & Q
3. Only P
4. Only Q

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Q2) Which of the following statements is/are false ?

P: The clean-room strategy to software engineering is based on the incremental software process model. T

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1. Both P & Q
2. Neither P & Q
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The cleanroom software engineering process is a software development process intended to produce software with a certifiable level of reliability.

The focus of the cleanroom process is on defect prevention, rather than defect removal.

The Cleanroom approach to software development is based on five key strategies :

1. Formal specification,
2. Incremental development,
3. Structured programming,
4. Static verification, and
5. Statistical testing of the system.

So, none given statements are false.

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Q3) Which of the following statements is/are true ?

P: Software Reengineering is preferable for software products having high failure rates, having poor design and/or having poor code structure

Q: Software Reverse Engineering is the process of analyzing software with the objective of recovering its design and requirement specification.

1. Only P
2. Only Q
3. Both P & Q
4. None of these

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everytime version

Q3) Which of the following statements is/are true ?

P: Software Reengineering is preferable for software products having high failure rates, having poor design and/or having poor code structure

Q: Software Reverse Engineering is the process of analyzing software with the objective of recovering its design and requirement specification. ✓

1. Only P
2. Only Q
3. [✓ Both P & Q]
4. None of these

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Q4) Software coupling involves dependencies among pieces of software called modules. Which of the following are correct statements with respect to module coupling ?

P: Common Coupling occurs when two modules share the same global data.

Q: Control Coupling occur when modules share a composite data structure and use only part of it.

R: Content coupling occurs when one module modifies or relies on the internal working of another module.

1. P & Q only
2. P & R only
3. Q & R Only
4. P, Q, R all three

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expected

Q4) Software coupling involves dependencies among pieces of software called modules. Which of the following are correct statements with respect to module coupling ?

P: Common Coupling occurs when two modules share the same global data. T

Q: Control Coupling occur when modules share a composite data structure and use only part of it.

flow control flag → Counter stamp ←

R: Content coupling occurs when one module modifies or relies on the internal working of another module.

True N

1. P & Q only
2. **P & R only** ✓
3. Q & R Only
4. P, Q, R all three

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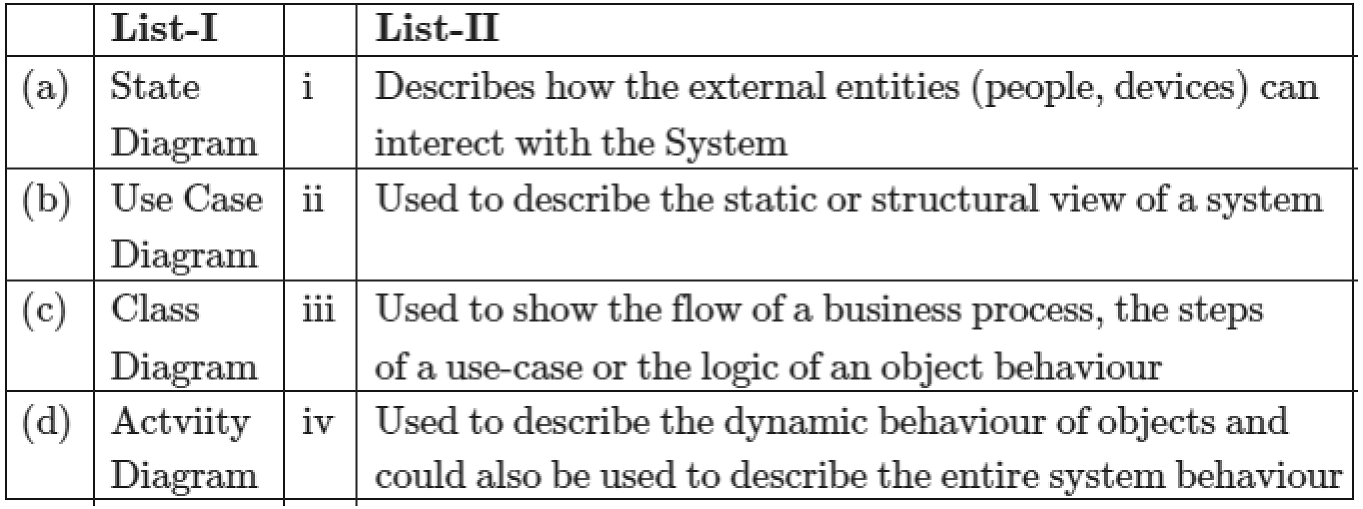
Q5



	List-I		List-II
(a)	State Diagram	i	Describes how the external entities (people, devices) can interect with the System
(b)	Use Case Diagram	ii	Used to describe the static or structural view of a system
(c)	Class Diagram	iii	Used to show the flow of a business process, the steps of a use-case or the logic of an object behaviour
(d)	Actviity Diagram	iv	Used to describe the dynamic behaviour of objects and could also be used to describe the entire system behaviour

i. A-1 , B-4, C-3, D-2

ii. A-4 , B-2, C-1, D-3

iii.A-4 , B-1, C-2, D-3

iv.A-1 , B-4, C-2, D-3

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Behavioral

UML

ERD –

Roles

States → object

	List-I		List-II
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(d)	Actviity Diagram	iv	Used to describe the dynamic behaviour of objects and could also be used to describe the entire system behaviour

states

i. A-1 , B-4, C-3, D-2

ii. A-4 , B-2, C-1, D-3

iii. A-4 , B-1, C-2, D-3 ✓

iv. A-1 , B-4, C-2, D-3

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updation

Reliability

S.I

Q6) A legacy software system has 940 modules. The latest release require that 90 of these modules be changed. In addition, 40 new modules were added and 12 old modules were removed. Compute the software maturity index for the system.

formula - 2 Repeat

1. 0.725
2. 0.923
3. 0.849
4. 0.524

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Q6) A legacy software system has 940 modules. The latest release require that 90 of these modules be changed. In addition, 40 new modules were added and 12 old modules were removed. Compute the software maturity index for the system.

1. 0.725
2. 0.923
3. 0.849
4. 0.524

Twist

SMI

Fa/Fc/Fd → Mt

SMI – is the Software Maturity Index value.

Mt – is the number of software functions/modules in the current release.

Fc – is the number of functions/modules that contain changes from the previous release.

Fa – is the number of functions/modules that contain additions to the previous release.

Fd – is the number of functions/modules that are deleted from the previous release.

Add changes delete

$$\text{MI} = \text{Mt} - (\text{Fa} + \text{Fc} + \text{Fd}) / \text{Mt}$$

$$\text{SMI} = (940 - (40 + 90 + 12))/940$$

$$= 0.8489$$

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MS Project → s/w

numerical

2018, 2019

SM → calculate

Q7) In PERT/CPM, the merge event represents___________ of two or more events.

definition

→ paper

1. Splitting
2. Completion
3. Beginning
4. Joining

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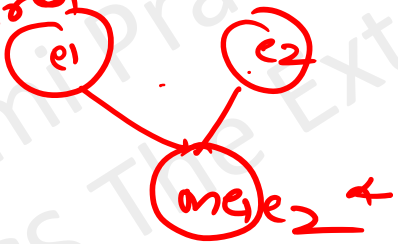
sort

Q7) In PERT/CPM, the merge event represents ___completion___ of two or more events.

Keyword



← complete

1. ~~Splitting~~
2. Completion ✓
3. ~~Beginning~~
4. Joining ✓

add

steps

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Types

2018, 2019, 2020 Properties

2021 - difference

Q8) Which of the following is not one of the principles of agile software development method ?

Properties

1. Following the plan | drawback → No doc.)
2. Embrace change (yes)
3. Customer Involvement → All
4. Incremental Delivery (Agile)

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Q8) Which of the following is not one of the principles of agile software development method ?

1. Following the plan
2. Embrace change
3. Customer Involvement
4. Incremental Delivery

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MCQ - Type 2

2019

Q9) Software products need perfective maintenance for which of the following reasons ?

Type 1

1. To rectify bugs observed while the system is in use → Corrective
2. When the customers need the product to run on new platforms Adaptative
3. To support the new features that users want it to support Perfective
4. To overcome wear and tear caused by the repeated use of the software Preventive

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Dec 2018

10

Q9) Software products need perfective maintenance for which of the following reasons ?

1. To rectify bugs observed while the system is in use
2. When the customers need the product to run on new platforms
3. To support the new features that users want it to support
4. To overcome wear and tear caused by the repeated use of the software

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Software Engineering

July 2018 PYQs

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2018 → 2020 Same pattern

Q1)Assume the following regarding the development of a software system P: - Estimated lines of code of P : 33, 480 LOC - Average productivity for P : 620 LOC per person-month - Number of software developers : 6 - Average salary of a software developer : ` 50,000 per month If E, D and C are the estimated development effort (in person-months), estimated development time (in months), and estimated development cost (in ` Lac) respectively, then (E, D, C) =________

effort devp. cost Math

1. (48, 8,24)
2. (54, 9, 27)
3. (60,10,30)
4. (42, 7,21)

P = 33,480

Person/month

(D) Productivity = $\frac{\text{Size/work}}{\text{Time}}$

(C) Cost = Time * Salary(pm)

(A) Effort = $\frac{\text{Size}}{\text{Productivity}}$

(B) Duration = $\frac{\text{Effort}}{\text{Team Size}}$

COCOMO

(E) $E = a(\text{KLOC})^b$

(F) $D = c(E)^d$

** Try

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Q1)Assume the following regarding the development of a software system P: - Estimated lines of code of P : 33, 480 LOC - Average productivity for P : 620 LOC per person-month - Number of software developers : 6 - Average salary of a software developer : ` 50,000 per month If E, D and C are the estimated development effort (in person-months), estimated development time (in months), and estimated development cost (in ` Lac) respectively, then (E, D, C) =________

$$Size := \frac{optimistic + 4(likely) + Pessimistic}{6}$$

1. (48, 8,24)
2. (54, 9, 27)
3. (60,10,30)
4. (42, 7,21)

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keywords

Q2) Match the following

(a) Product Complexity	**(i) Software Requirements Definition**
(b) Structured System Analysis	**(ii) Software Design**
(c)Coupling and Cohesion	**(iii)Validation Technique**
(d)Symbolic Execution	**(iv)Software Cost Estimation**

i. A-2 , B-3, C-4, D-1

ii. A-3 , B-1, C-4, D-2

iii. A-4 , B-1, C-2, D-3

iv. A-3 , B-4, C-1, D-2

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SRS → Analysis

Q2) Match the following

easy

✗ (a) Product Complexity (4)	(i) Software Requirements Definition
✗ (b) Structured System Analysis (1)	(ii) Software Design
✗ (c)Coupling and Cohesion	(iii)Validation Technique (Testing)
✗ (d)Symbolic Execution	(iv)Software Cost Estimation

user

dev.

i. A-2 , B-3, C-~~4~~, D-1 eliminate

ii. A-3 , B-1, C-~~4~~ 2, D-2

✓ iii. A-4 , B-1, C-2, D-3 ✓

iv. A-3 , B-4, C-~~1~~ 2, D-2

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SCM

Q3) Which one of the following is not typically provided by Source Code Management Software ?

1. Synchronization
2. Versioning & history
3. Syntax Highlighting
4. Project Forking

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2018 - 2020

Traditional

2019

Q3) Which one of the following is not typically provided by Source Code Management Software ?

configuration , version , Git → Version Control System

1. Synchronization ✓
2. Versioning & history ✓
3. Syntax Highlighting
4. Project Forking ✓

① version/change ctrl

② audit , report

③ Release , distributed

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Maths

Q4) A software system crashed 20 times in the year 2017 and for each crash, it took 2 minutes to restart. Approximately, what was the software availability in that year?

1. 96.9924%
2. 97.9924%
3. 98.9924%
4. 99.9924%

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100-25E Cr 2 min = 120 sec (Papul)

2017 → 20 times crash

365 days × 2 time

40 min

$$= \frac{365 \times 24 \times (60 - 40)}{365 \times 24 \times 60} = 0.33$$

Q4) A software system crashed 20 times in the year 2017 and for each crash, it took 2 minutes to restart. Approximately, what was the software availability in that year?

1-0.33 = TRICK

SE ✓

1. 96.9924%
2. 97.9924%
3. 98.9924%
4. 99.9924% ✓

365 days have 525600 minutes. It takes 2 minutes to restart the computer In 2017 computer crash for 20 times. i.e. system was available for 525560 minutes Software availability = 525560 / 525600 = .999924 or 99.9924 %

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2020

1 min

Q5) Match the 5 CMM Maturity levels/CMMI staged representations in List- I with their characterizations in List-II codes:

Quality

List - I	List - II
✓ (a) Initial	(i)Processes are improved quantitatively and continually.
✓ (b)Repeatable	(ii) The plan for a project comes from a template for plans.
✓ (c)Defined	(iii)The plan uses processes that can be measured quantitatively.
✓ (d)Managed	(iv)There may not exist a plan or it may be abandoned.
✓ (e)Optimizing	(v)There’s a plan and people stick to it.

i. A-4 , B-5, C-3, D-4

ii. A-1 , B-2, C-5, D-3

iii. A-5 , B-4, C-3, D-1

iv. A-4 , B-5, C-3, D-1

09

2014
↓
2018
↓ 2019
2020

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Q5) Match the 5 CMM Maturity levels/CMMI staged representations in List- I with their characterizations in List-II codes:

List - I	List - II
(a) Initial	(i)Processes are improved quantitatively and continually.
(b)Repeatable	(ii) The plan for a project comes from a template for plans.
(c)Defined	(iii)The plan uses processes that can be measured quantitatively.
(d)Managed	(iv)There may not exist a plan or it may be abandoned.
(e)Optimizing	(v)There's a plan and people stick to it.

i. A-4 , B-5, C-3, D-4

ii. A-1 , B-2, C-5, D-3

iii. A-5 , B-4, C-3, D-1

✓ iv. A-4 , B-5, C-3, D-1

Q1 → cmm

Q2 → levels = 5

Q3 → Why - Quality

Q4 → Yes (It is used in each phase of s/w process model)

Q5) → levels → hierarchy (name)

Q6 → level → functionality

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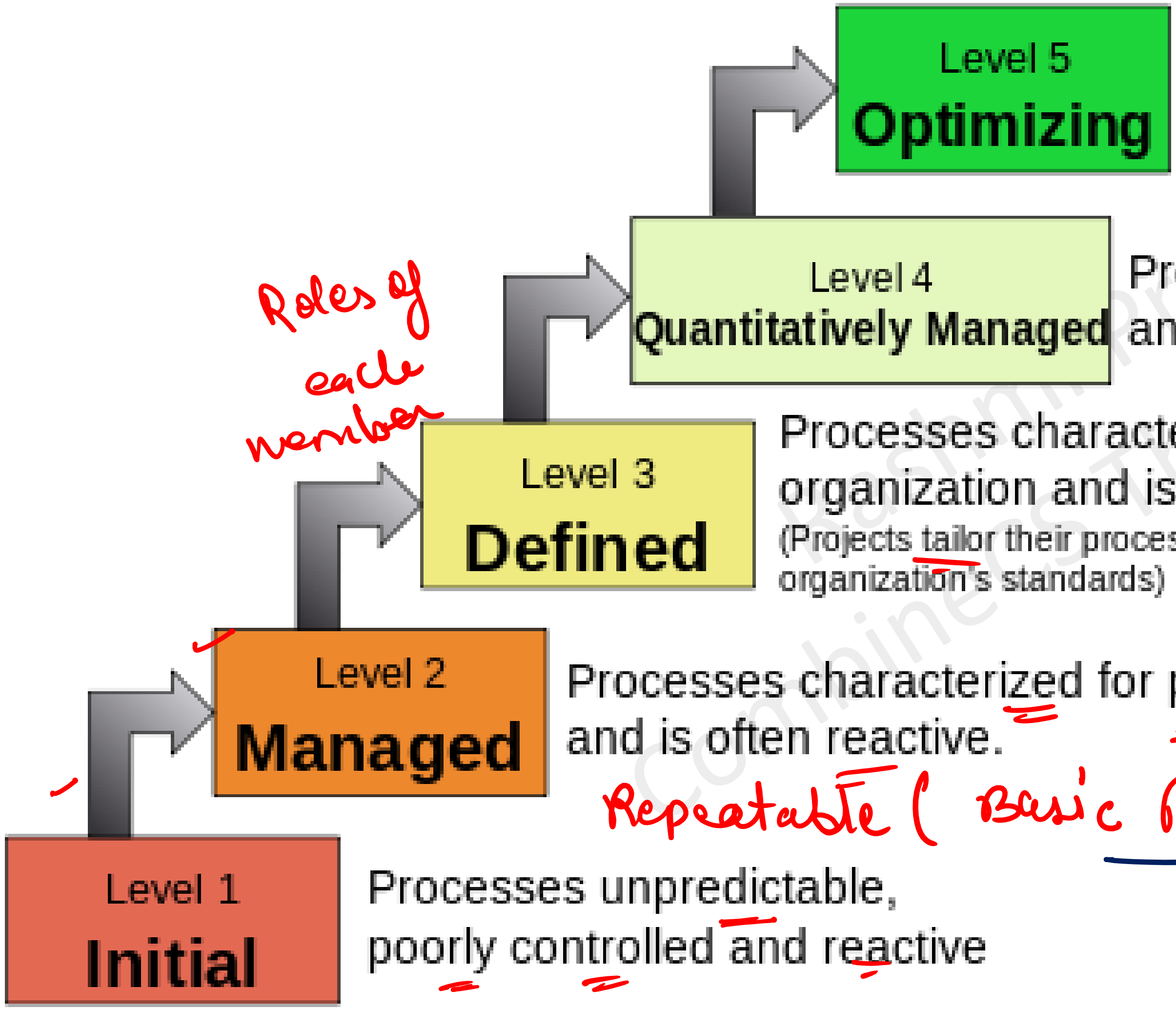
Characteristics of the Maturity levels

Q7)) MCQ

I —
M —
D —



Level 5
Optimizing

Focus on process improvement

(Continuous Process Improvem

Level 4
Quantitatively Managed

Processes measured and controlled

Process Measurement

Qty Quality

Level 3
Defined

Processes characterized for the organization and is proactive.
(Projects tailor their processes from organization's standards)

(Project definition)

Roles of each member

Level 2
Managed

Processes characterized for projects and is often reactive.

Repeatable (Basic Project mngt)

Level 1
Initial

Processes unpredictable, poorly controlled and reactive

Adhoc

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CMM levels

(1) Adhoc | → No properties

(2) Repeatable | Managed → SCM , SQA
S/w Req. mngt
→ Project Planning
→ Project Monitoring

(3) Defined → training Prog.
Peer Reviews
Integrated S/w mngt

(4) Managed → S/w Quality mngt
Quantitative Process mngt

(5) Optimized → Process change mngt
Technology ,,
Defect Prevention

Q8 which is the step involve in repeatable level of cmm?

✓ a) SCM
b) Quality Imp. ✗
c) Technology change m ✗
✓ d) Project Planning

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✓ Dec 2018 → July 2018

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Q6) Coupling is a measure of the strength of the interconnections between software modules. Which of the following are correct statements with respect to module coupling ?

P : Common coupling occurs when one module controls the flow of another module by passing it information on what to do. ✗ Control

Q : In data coupling, the complete data structure is passed from one module to another through parameters. ✓

R : Stamp coupling occurs when modules share a composite data structure and use only parts of it.

1. P& Q
2. P & R
3. Q & R
4. All P, Q, R

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Q6) Coupling is a measure of the strength of the interconnections between software modules. Which of the following are correct statements with respect to module coupling ?

✗ P : Common coupling occurs when one module controls the flow of another module by passing it information on what to do. low

control

Q : In data coupling, the complete data structure is passed from one module to another through parameters.

R : Stamp coupling occurs when modules share a composite data structure and use only parts of it.

1. P& Q
2. P & R
3. **Q & R** ✓
4. All P, Q, R

cohesion → independent → high

○ ○

coupling

○○

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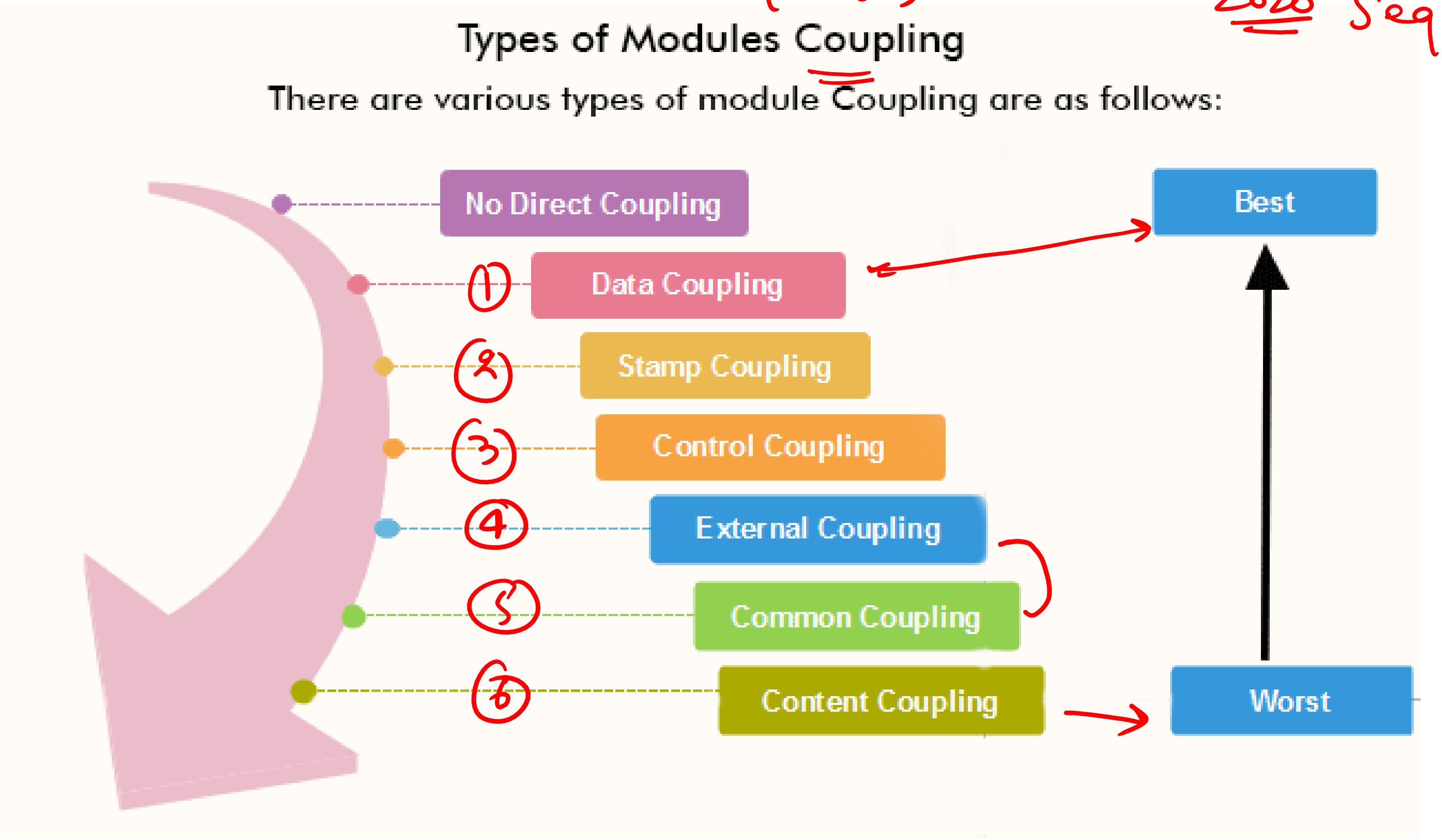
(low)



Types of Modules Coupling

There are various types of module Coupling are as follows:

- No Direct Coupling
- ① Data Coupling
- ② Stamp Coupling
- ③ Control Coupling
- ④ External Coupling
- ⑤ Common Coupling
- ⑥ Content Coupling

2020 Sequence arrange

2021 → property
→ low

① diff. b/w Cohesion Coupling

② sequence

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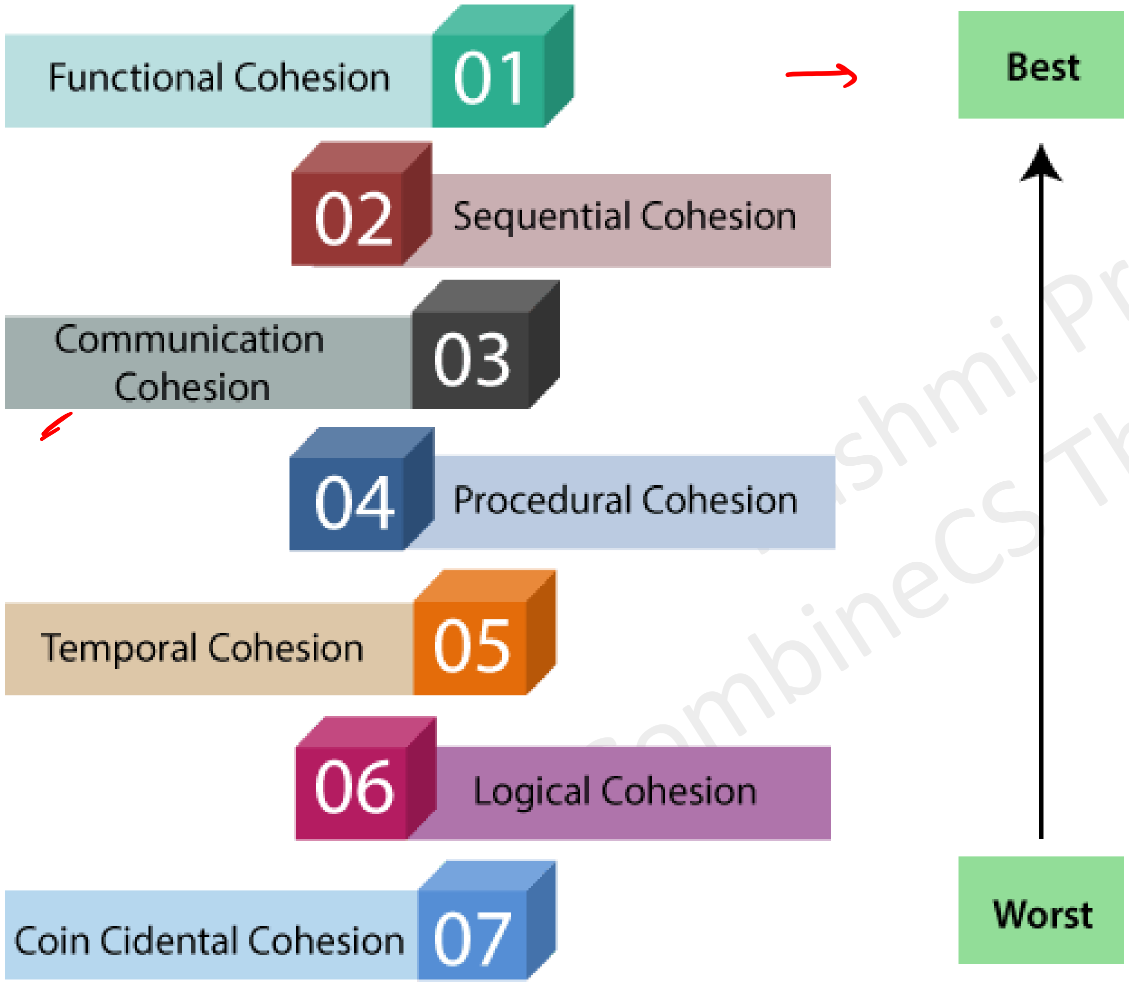
Q

Types of Modules Cohesion

→ high



1 video → TRICK

~~Rember~~

Remember

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Q7) A software design pattern often used to restrict access to an object is:

1. Adapter
2. Decorator
3. Delegation
4. Proxy

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July
2018

→ UML (OOP)

Q7) A software design pattern often used to restrict access to an object is:

"

"

Q 2017 → enhance functionality of an object at run-time ... ?
Java (OOPs)

~~1.~~ Adapter

2. Decorator

~~3.~~ Delegation

4. Proxy ✓

ans = Decorator
(Java) wrapperClass

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Q8) Reasons to re-engineer a software include :

Propeties

P : Allow legacy software to quickly adapt to the changing requirements

Q : Upgrade to newer technologies/platforms/paradigm (for example, object-oriented)

R : Improve software maintainability

S : Allow change in the functionality and architecture of the software

Code :

No

1. P, R, S only
2. P & R only
3. P,Q, S Only
4. P, Q & R only

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Q8) Reasons to re-engineer a software include : No highly expected

P : Allow legacy software to quickly adapt to the changing requirements

Q : Upgrade to newer technologies/platforms/paradigm (for example, object-oriented)

R : Improve software maintainability x (Reverse re-engineering)

S : Allow change in the functionality and architecture of the software

Code :

1. P, ~~R~~, S only
2. P & ~~R~~ only
3. P,Q, S Only
4. P, Q ~~& R~~ only

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Q9)Which of the following is not a key strategy followed by the clean room approach to software development?

1. Formal Specification
2. Dynamic Verification
3. Incremental Development
4. Statistical testing of the system

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Q9)Which of the following is not a key strategy followed by the clean room approach to software development?

1. Formal Specification
2. Dynamic Verification static
3. Incremental Development
4. Statistical testing of the system

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Q10) Which of the following statements is/are True ?

P : Refactoring is the process of changing a software system in such a way that it does not alter the external behavior of the code yet improves the internal architecture.

Q : An example of refactoring is adding new features to satisfy a customer requirement is covered after a project is shipped.

Code :

1. P only
2. Q only
3. Both P & Q
4. None of these

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Q10) Which of the following statements is/are True ?

P : Refactoring is the process of changing a software system in such a way that it does not alter the external behavior of the code yet improves the internal architecture.

improve

Q : An example of refactoring is adding new features to satisfy a customer requirement is covered after a project is shipped. ×

changes are not allowed

Code :

1. P only ✓
2. Q only
3. Both P & Q
4. None of these

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#X

Testing

SE Topics	DEC 2018	July 2018	2019	2020	2021
✓ Maintenance	1	1	1	1	
✓ Agile Model	1	×	1 ✓	1 + 1	
PERT / CPM	1				/
SCM		1	—	—	
✓ Reliability	1			✓	
✓ SRS	1		✓	✓ (MCQ)	
Cleanroom Strategy	1	1			
Refactoring		1			
✓ Software Re-engineering	1	1	✓	✓	
✓ Cohesion & Coupling	1	2 + 1	✓	✓	
✓ UML Diagram	1		✓	✓	
✓ COCOMO		1+1	✓	✓	
✓ CMM		1			
TOTAL	9 10	11	10	10	

easy
↓
X

d

moderate
↓
lengthy

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Telegram Channel : https://t.me/combinecs
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https://chat.whatsapp.com/GruovhRvste1nL8L2X1YQ3
☞ Join our WhatsApp group for (SCHOOL/JOB Notifications) :
https://chat.whatsapp.com/ExM4CZ2ZKxzEgPvSfOXNFb

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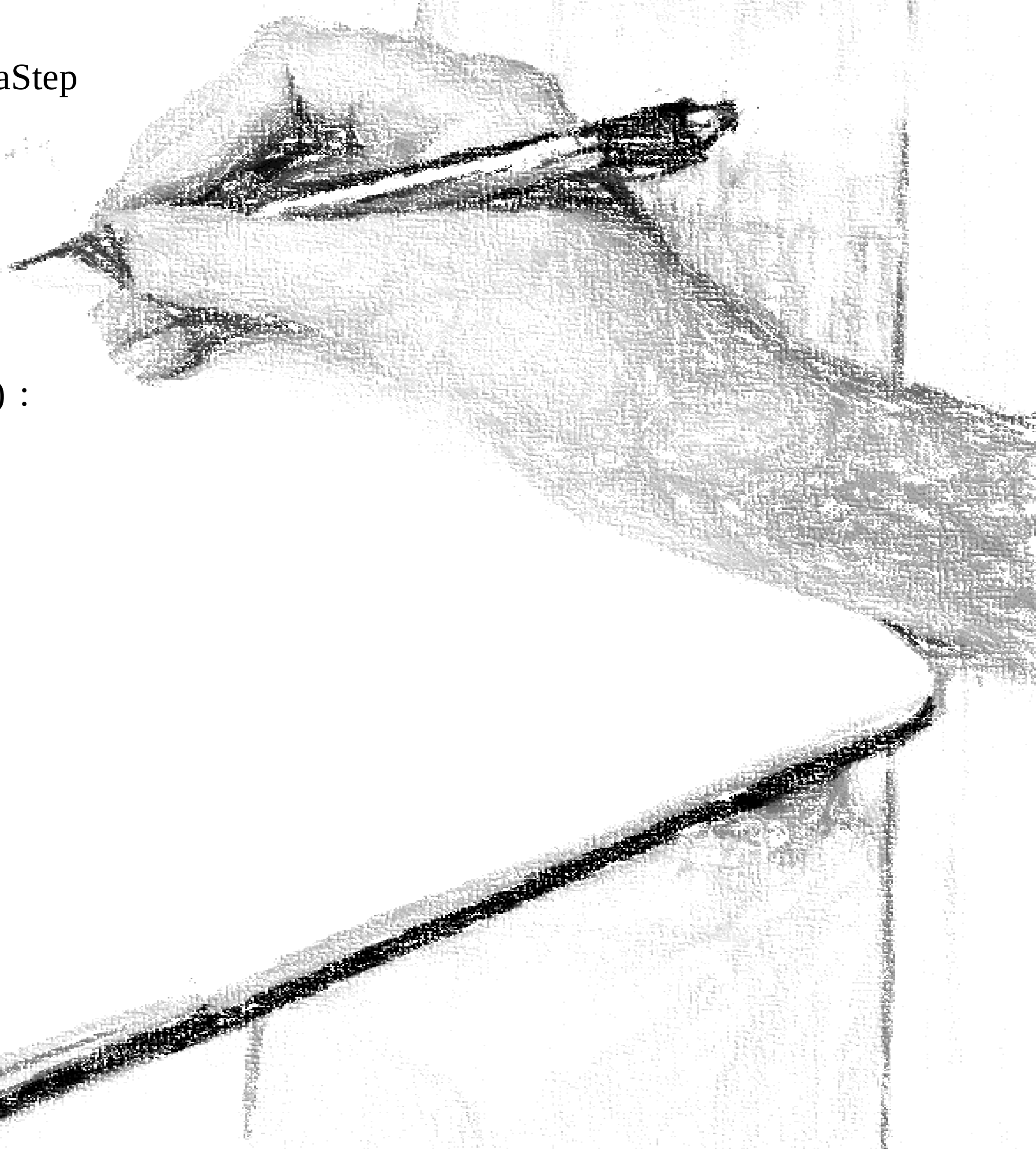

Thank you

Post your doubts in comment section.

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