

Department : CSE

Program : BSC in CSE

Course no : CSE 3223

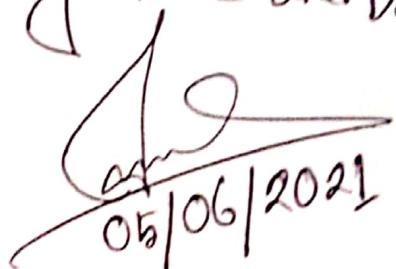
Course Title : Information

Examination : Semester  
Final

System Design and  
Software Engineering

Student no : 170204105

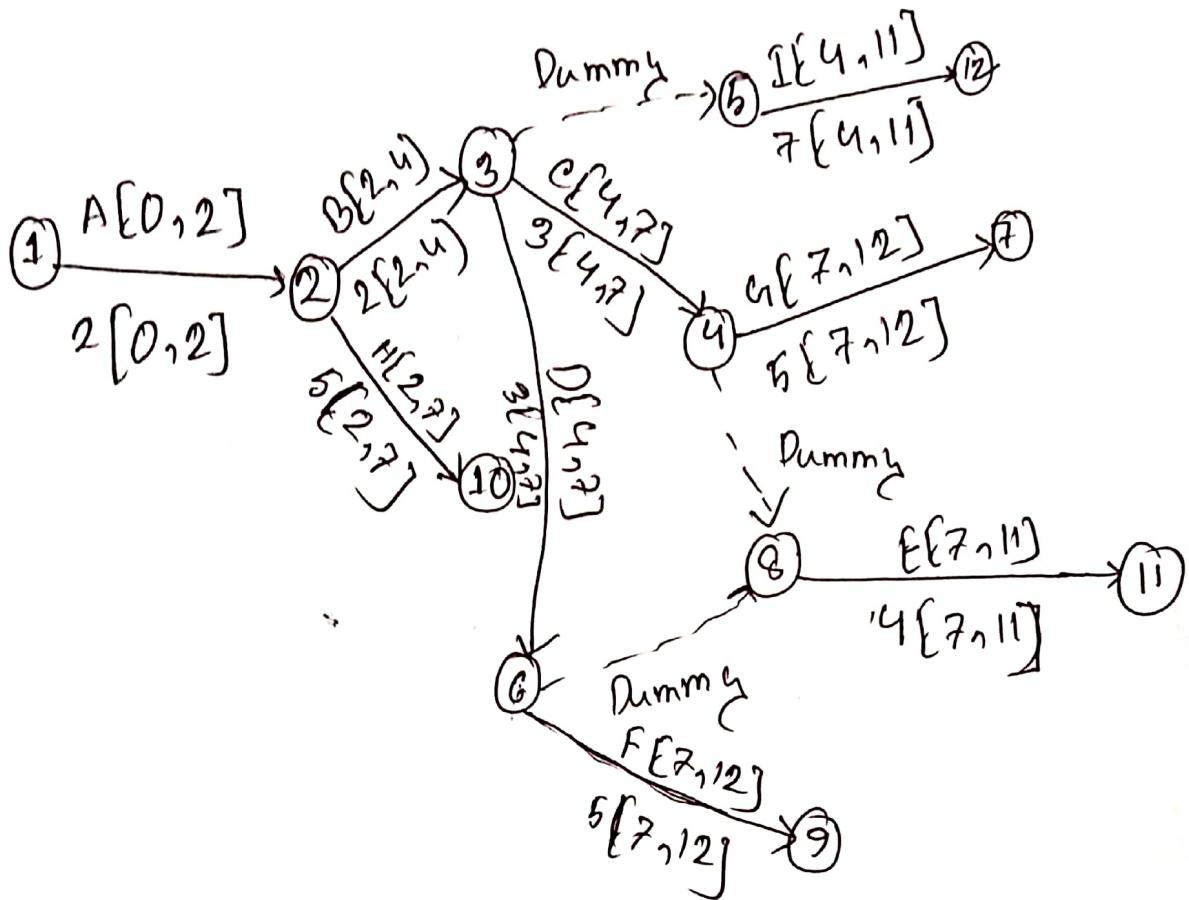
Signature and Date:



A handwritten signature in black ink, appearing to read 'Amit'.

05/06/2021

## Answers to the Question no: 1(a)



From the diagram, we can see that, we need 3 dummy activities, because we know that no 3 real-time activities can start on end from a node at a time. To solve this, we needed dummy activity.

1

Activity	Earliest Start (ES)	Latest Start (LS)	Earliest finish (EF)	Latest finish (LF)	Slack (LS - ES)	Critical Path
A	0	0	2	2	0	Yes
B	2	2	4	4	0	Yes
C	4	4	7	7	0	Yes
D	4	4	7	7	0	Yes
E	7	7	11	11	0	Yes
F	7	7	12	12	0	Yes
G	7	7	12	12	0	Yes
H	2	2	7	7	0	Yes
I	4	4	11	11	0	Yes

②

170204105  
CSE 3223  
Ganesh

## Grantt chart :

Activity	Completion Time (weeks)	Duration (weeks)												
		0	1	2	3	4	5	6	7	8	9	10	11	12
A														
B														
C														
D														
E														
F														
G														
H														
I														

③

Answer to the Question no: 1(b)

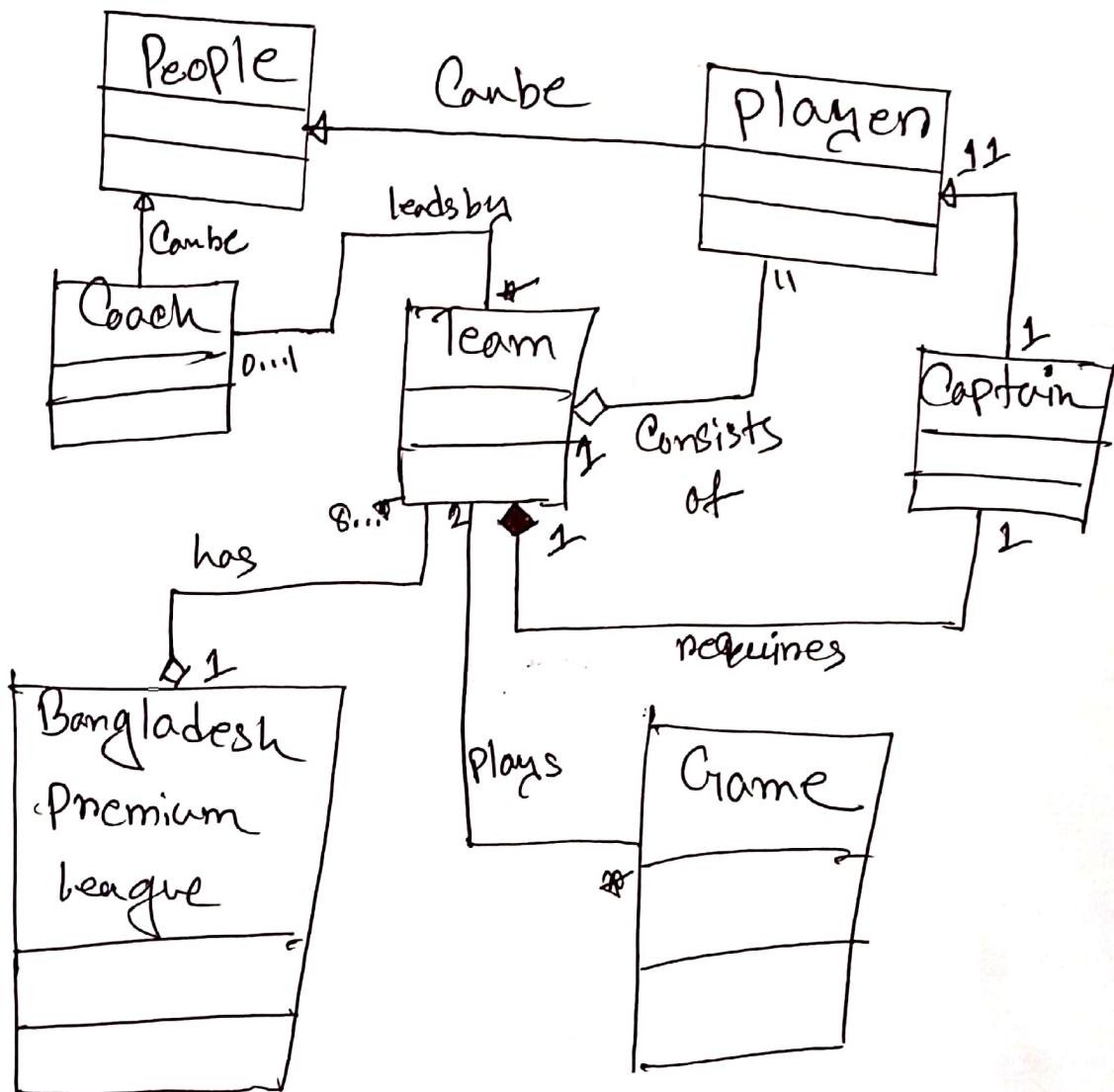


Fig: UML class diagram

Q1

## Answer to the question no: 2(a)

Waterfall Model: The waterfall Model was the first process model to be introduced. It is very simple to understand and use. In the waterfall approach, the whole process of software development is divided into separate phases.

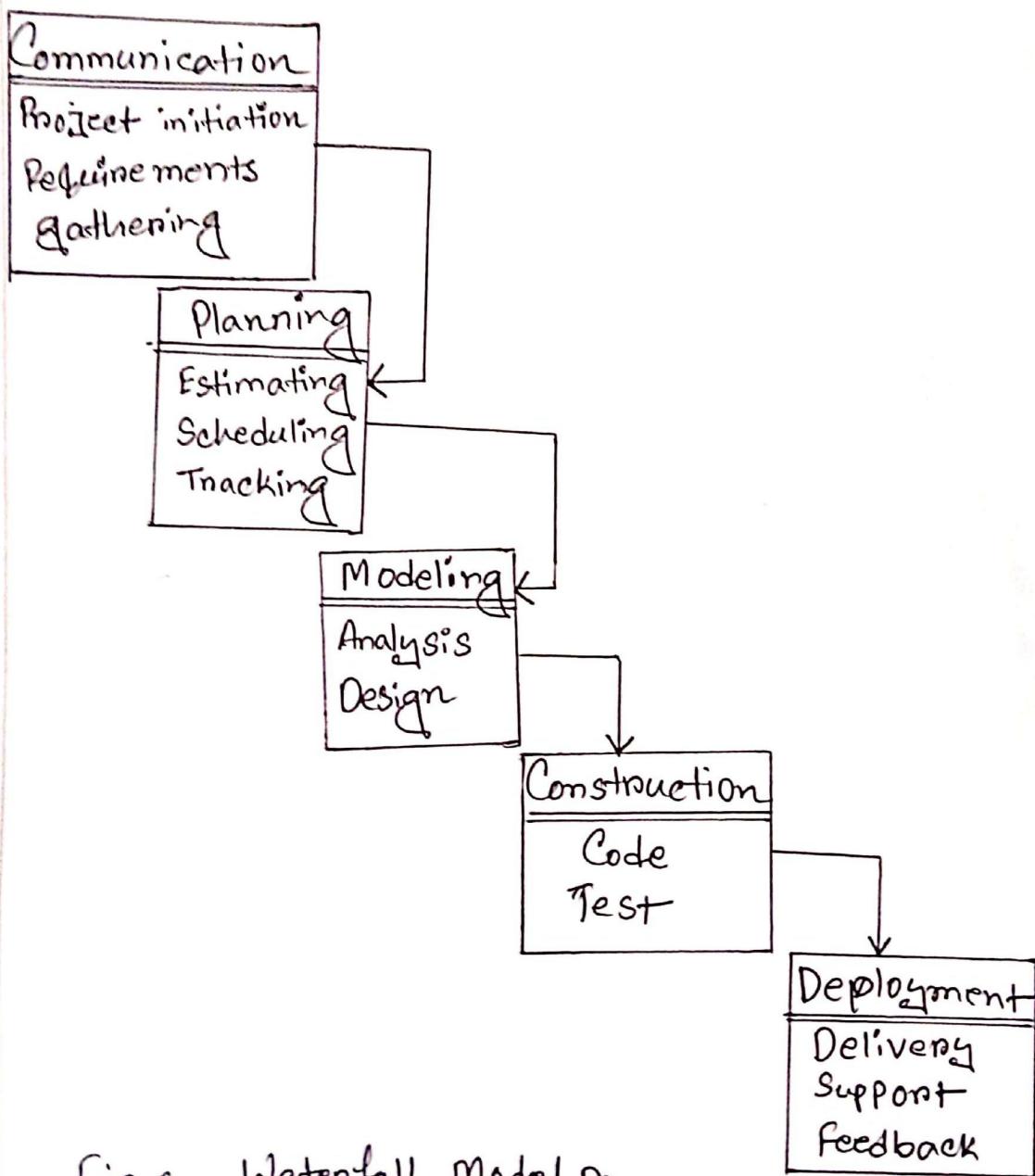


Fig: Waterfall Model Diagram

If we explained briefly, there are 6 phases in waterfall model. These are,

- ① Requirements: As specified by words, we need to know and understand what we have to design, what we have to develop, its processes, what will be its functionality etc.
- ② System Design: The requirement specifications from first phase are studied in this phase and the system design is prepared.
- ③ Implementation: With inputs from system design, the system is first developed in small programs called units, which are integrated into the phase.
- ④ Integration and Testing: All the units developed in the implementation phase are integrated into a system after testing of each unit.

⑤ Development of system: Once all the non-functional, functional, alpha and beta testing are done, the product of software is deployed to the user.

⑥ Maintenance: During the maintenance phase, the team ensures that the application is running smoothly on the servers without any downtime.

There are some problems and their solution of the waterfall model.

1. People blindly follow plans.

⑦ In the traditional method, people pay more attention to how things will happen during the right moment.

Solution: While planning is important, it is also important that developers and quality checkers understand how things should happen, especially with the client or the end-user.

2. Sequential process and changes become costly

Solution: It is inadequate as developers cannot just go back and change something in a previous phase as the consumers requirement change.

3. End-users do not know what they want

Solution: When it is time to hand over the finished product to a client, it is

⑧

likely that they will not like how it turned out.

4. Testing for quality may suffer.

Solution: It is possible to cut the testing stage short in order to meet the deadline.

Real life Example of water fall model.

Water fall model is like a making of TEA where all the above specified phase is same like.

① Requirement: Find out the need of making tea.

②

ii) System Design: making of tea in various phases, following the sequential order.

iii) Implementation: We are making tea which can be in units like boiling of water, putting sugar and tea and then milk separately.

iv) Integration and Testing: Here all the ingredients are put together which are in above phase are in units and finally testing of tea is done.

v) Development of system: Here the tea is served to the specific customers

vi) Maintenance: Tea is preserved, for the further uses.

Answer to the Question no - 2(b)

Mark Theile	
Responsibilities	Collaborations
iTunes ID	iTune Store
Credit	Library
Purchase	
Download in a library	
Debit an account	

11

### Answers to the question no - 2(c)

Regression testing : Regression testing is a black box testing techniques. It is used to authenticate a code change in the software does not impact the existing functionality of the product. Regression testing is making sure that the product works fine with new functionality, bug fixes.

### Example of Regression testing :

Consider a product Y in which one of the functionality is to trigger confirmation, acceptance, and dispatched email. It also needs to be tested to ensure that the change in the code not affected them.

12

Regression testing does not depend on any programming language like Java, C++, C# etc. This method is used to test the product for modifications on any update done.

Answer to the question no: 5(a)

Agile: Agile methodology is a practice that promotes continuous iteration of development and testing throughout the software development lifecycle of the project.

13

Deliver  
incrementally  
Instead of all at  
once

Distinguish between Extreme Programming (XP) and Adaptive Software Development (ASD).

Role of human	ASD	x P
Role of human	Central undisputed agents	Central undisputed agents.
Role of managers	Steer product, adapt it to changing requirement	Steer process, use pre-defined technique to do so.
Role of customers	Provide input to steer process are involved	Provide input to steer process are involved
19) Dotsatisfying work	as support	as key

Role of	ASD	XP
Role of Cooperation	Is key for emergence	Is key for working towards re-sults,
Application of technology	Human utilize technology at will	Human utilize technology with in predefined frame work

(b)

## Answer to the question no : 5 (b)

Project feasibility : feasibility study in Software Engineering is a study to evaluate feasibility of proposed project on system.

Types of feasibility study:

① Technical feasibility: Current resource both HW & SW along with required technology are analyzed and assessed to develop project. It also analyzes technical skills.

② Operational feasibility: It provides service to requirements. Here degree to which requirements are analyzed along with how much

⑥

every product will be to operate and maintain after deployment

3. Economics: Here cost and benefit of the project is analyzed. A detailed analysis is carried out what will be cost of the project for development including all costs.

4. Legal: In legal feasibility study project is analyzed in legality point of view, including bannings of legal implementation of project, project certificate etc.

(17)

5. Schedule: Here timelines deadlines is analyzed for proposed project which includes how many times team will take to complete final project. So that it can be completed with in due time.

## Answers to the question no; 3(a)

The given interview structure follows the diamond structure because.

- the interview started with closed question and then moved towards ~~Closed Question is like asking~~  
~~Open-ended question~~
- Also the structure began in very specific way to examine general issues.
- The lastly, it again moved towards closed questions before ending.
- And then concluded with specific answers.

Thus justification was provided in favor of my answer.

Now rearranging the interview question sequence, we get,

1. What kind of documents do I require to open a bank account?
2. How can I add a nominee to my account?
3. How long will it take to get my cheque book?
4. How can I apply for a loan?
5. What loan am I eligible for?
6. What are the charges of the debit card?
7. Can I send money overseas through your bank?

8. How do I repay the loan?

9. How can I open my account?

10. Could you please explain your online banking system?

After rearranging the question, I can conclude that the structure is pyramid which began with very detailed, closed questions and expanded by allowing open-ended questions and more generalized responses. The intention was to warm up to the interview to the topic by starting with closed questions and working towards open-ended questions.

## Answer to the question no - 3(b)

Difference between alpha and beta testing;

Alpha Testing	Beta Testing
1. Performed by testing who are actually internal employees of the organization	1. Is performed by clients on end users who are not employees of the organization
2. Performed at developer's site.	2. Performed at a client location
3. Reliability and security testing are not performed in depth.	3. Reliability, security, robustness are checked in depth
4. Involves both the white box and black box technique.	4. Typically uses black box technique.

h. Long execution cycle may be required.

i. Only a few weeks of execution are required.

Example : We use Microsoft Windows operating system in our day-to-day uses. Right now, Windows 10 is the latest version. Initially, after completion of Windows 10, it goes through an Alpha testing phase. By that phase, it gives a better insight into the product. It helps to understand the ~~target~~ user's point of view and experience while using the product. Performing alpha testing

Ans

formally and strictly helped to meet its objectives successfully and led to customers' happiness.

By doing the beta testing, Microsoft was able to get thousands of user feed back and based on ~~the~~ those feed back they managed to release a stable version.

(24)

## Answer to the Question no: 6(a)

Difference between spiral model and Prototype model.

Prototype Model	Spiral Model
1. Prototype model is a Software development model in which a prototype is built tested and the refined as per customer needs.	1. Spiral model is a risk- driven software development model and is made with features of incremental waterfall model.
2. Referred to as rapid on closed ended, prototyping.	2. Is also referred to as meta model.
3. Cost effective quality improvement in very much possible.	3. Cost effective improvement is not possible in spiral model.

(2h)

4. It is also referred to as a rapid or closed ended prototype.	4. It is also referred to as meta model.
5. In prototype model improvement of quality does not increase the cost of product.	5. Improvement of quality can increase the cost of product.
6. It is a trial-and-error kind of model. Only specification refinement of the customer are not clear.	6. It is suitable when the customer specifications requirements are clear.

## Formal method model:

The formal method model is an approach to software engineering that applies mathematical methods and techniques to the process of developing complex software system. The approach uses a formal specification language to define each characteristic of the system.

Formal methods comprise formal specification using mathematics to specify the desired properties of the system. Formal specification is expressed in a language

②

whose syntax and semantics are

P. & O

formally defined.

Such models are subject to proof check with regards to stability and reliability, process validation is a core process for evaluating model using automatic theorem proofs, this is based on a set of mathematical axioms to be proven called proof obligation.

Example of formal method:

B method: B is an example of formal method techniques that covers the whole development life-cycle.   
 26

divides, software and separated Components  
that further and separated Components  
that further represents as Abstract  
machines.

$\beta$  methods represent system models in  
the form of mathematical expressions  
and Abstract Notation machine  
(ANM). These are further subject  
to Stepwise refinement and proof  
obligation evalut. This consists of  
nification of invariant preservation  
and refinement enumeratives. The  $\beta$   
method is a widely - cited

Q2

technique in scientific publication

Concerning formal method implementation  
No ~~today~~ <sup>today</sup> It used in the specification  
for transport automation system in  
Paris Paris and Sao Paulo by Siemens  
transportation system.

## Answers to the question no - 6(B)

Scrum is a process framework that is used for developing and sustaining complex products. It is a framework within which people can ~~not~~ address complex adaptive problems, while productively and creatively delivering products of the highest possible value. Scrum is not a process or a technique for building products rather ~~than~~ than it is a framework that has been employed various processes and techniques. The Scrum framework consists of Scrum

③1

team and their associated notes, events, artifacts, rules etc. Each component within the frame work, scrums a specific purpose and is essential to scrums success and usages. The rule of Scrum binds to get them the events, notes and artifacts governing the relationship and instruction between them.

(32)

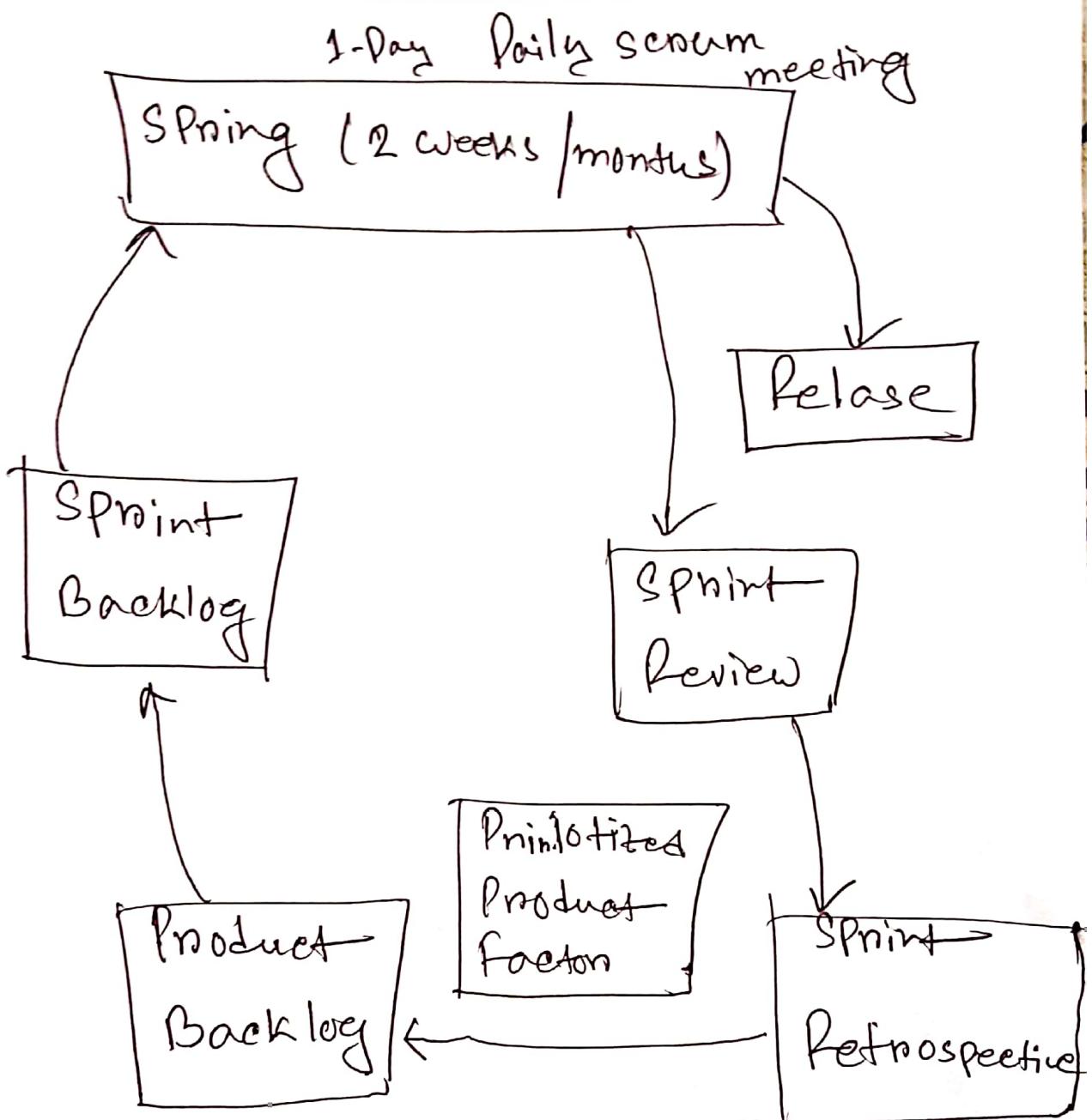


Fig: Scrum frame work

## Answer to the question no-6(c)

### Verification in Software testing:

Verification in software testing is a process of checking documents, design, code and program in order to check if the software has been built according to the requirements or not, the main goal of verification process is to ensure quality of software application design, architecture etc.

### Validation in software Testing:

Validation in software testing is a dynamic mechanism of testing and validation if the software produces

(24)

actually meets, the exact needs of customer or not. The validation process involves activities like testing, integration testing, system testing are used acceptance testing.

35