knowledge sources in domain analysis

b) (F)

Quality (and functional) req

b) (F)

oftware artifacts can

and which is

[10 M

wo activities of Requirements Engineering Process. [2 m

1- Eliciting req.

2- Analyzing req.

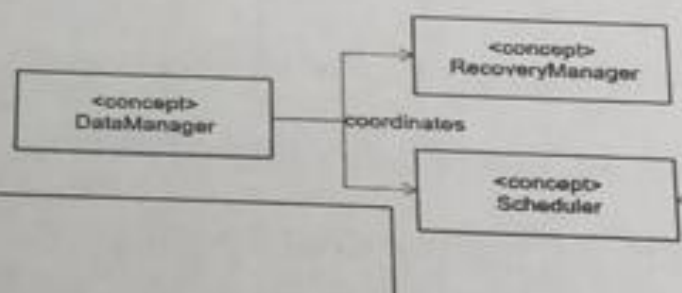
3- Specifying req.

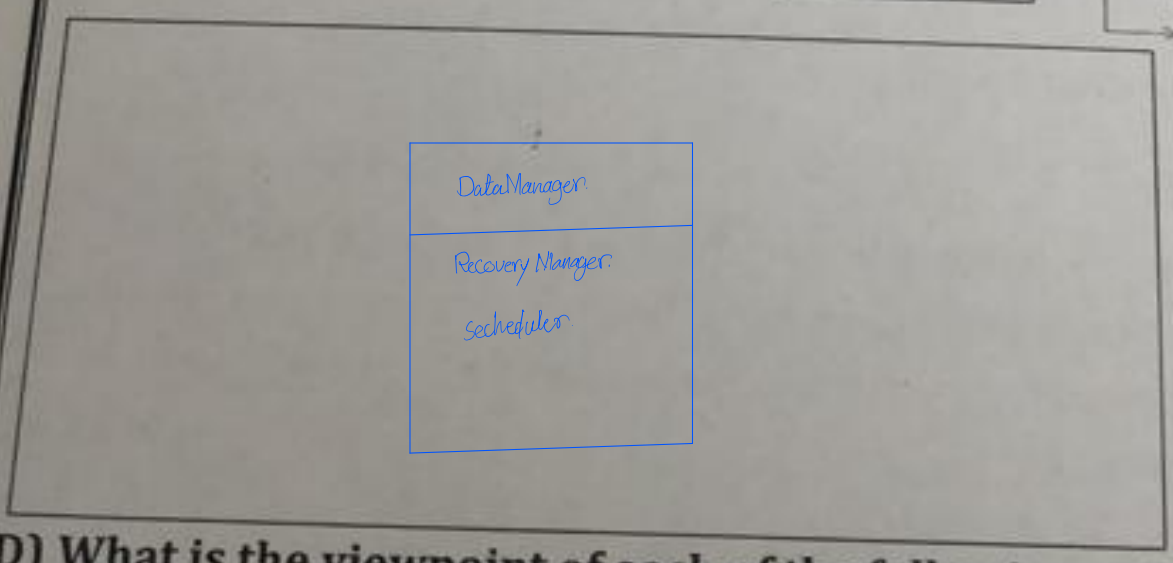
B) State three of the requirements representing techniques. [3 r

1. 1- Functional req. 1- use case diagram.
2. 2- non-Functional req. 2- scenarios.
3. 3- Domain req. 3- state diagrams.

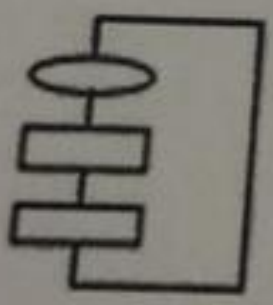
C) Map the following SA into design considering performance quality attrib

[



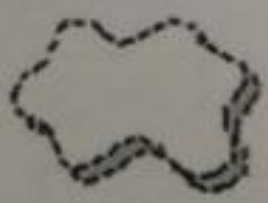


D) What is the viewpoint of each of the following notations?



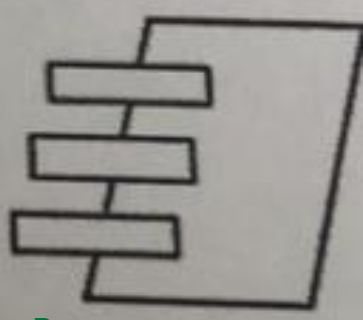
Module

Dev. Viewpoint - Notation.



Class Utility

Logical Viewpoint - Notation



Process

Process Viewpoint - Notation

Go

Question 1 [10 Mar

In each of the following, choose the correct answer among a- d. (TICK ONLY ON

1. _____ are representation of a system from the perspective of one more concerns which are held by one or more stakeholders.
   a) Views.
   b) Viewpoints.
   c) Models.
   d) Concerns.

2. The concerns of logical view are _____
   a) Performance.
   b) Functional requirements.
   c) Software management.
   d) Understandability.

3. Use case view in UML corresponds _____ view in Kruchten's 4+1 views.
   a) Process View.
   b) Physical view
   c) Scenario view
   d) Deployment view.

4. Modules and subsystems are models used to represent components in _____ view:
   a) Process View.
   b) Scenario view.
   c) Physical view.
   d) Development view.

5. Adaptability quality factor might conflict with _____.
   a) Safety
   b) Reuse.
   c) Availability.
   d) Time Performance.

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6. _____ can be used to represent large systems characterized with a mix
low- and high-level issues, where high-level operations rely on low level issue

a) Layers Patterns.

b) Pipes and filter patterns.

c)Repository/blackboard patterns.

d) Proxy patterns.

7. If a client issues a request to Layer N in layer pattern since Layer N cannot c
out on its own, it calls the next Layer N-1 for supporting subtasks. This Scen
is called _____.

a) Bottom-up notifications

b) Top-down requests

c) requests travel just a subset of layers

d) Event.

8. Compilers are examples for _____ pattern.

a) Layers Patterns.

b) Pipes and filter patterns.

c)Repository/blackboard patterns.

d) Proxy patterns.

9. Patterns should be selected based on _____.

a) The quality factors that they address.

b) The experience of the architect.

c) The concerns of the stakeholders.

d) All the above.

10. Compile-time adaptability can be modeled in design using _____

a) Part-of.

b) message passing.

c) Inheritance.

d) Inlined code.

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Question 2 [10 Marks]

Assign which of the following is True (T) and which is False (F).

1. Adaptability is the ease with which software artifacts can be adapted to changing requirements.
   a) (T) b) (F)

2. Design alternatives are yield due to Quality (and functional) requirements.
   a) (T) b) (F)

3. Textbooks are the most important knowledge sources in domain analysis.
   a) (T) b) (F)

4. Requires rule defines a mutual exclusion relation between concepts of features
   a) (T) b) (F)

5. Mandatory (must) features are that features that each application can have or not.
   a) (T) b) (F)

6. Commonality Analysis is used to filter the domain raw data.
   a) (T) b) (F)

7. The exhaustive definition of requirements are the statements that identify essential needs of a system in order for it to satisfy customer (stakeholder) needs.
   a) (T) b) (F)

8. Architectural drivers are defined by stakeholder concerns and consist of jus high-level functional requirements.
   a) (T) b) (F)

9. SA methods can be classified according to the ~~source~~ (Scop) into Single-syste Multi-system.
   a) (T) b) (F)

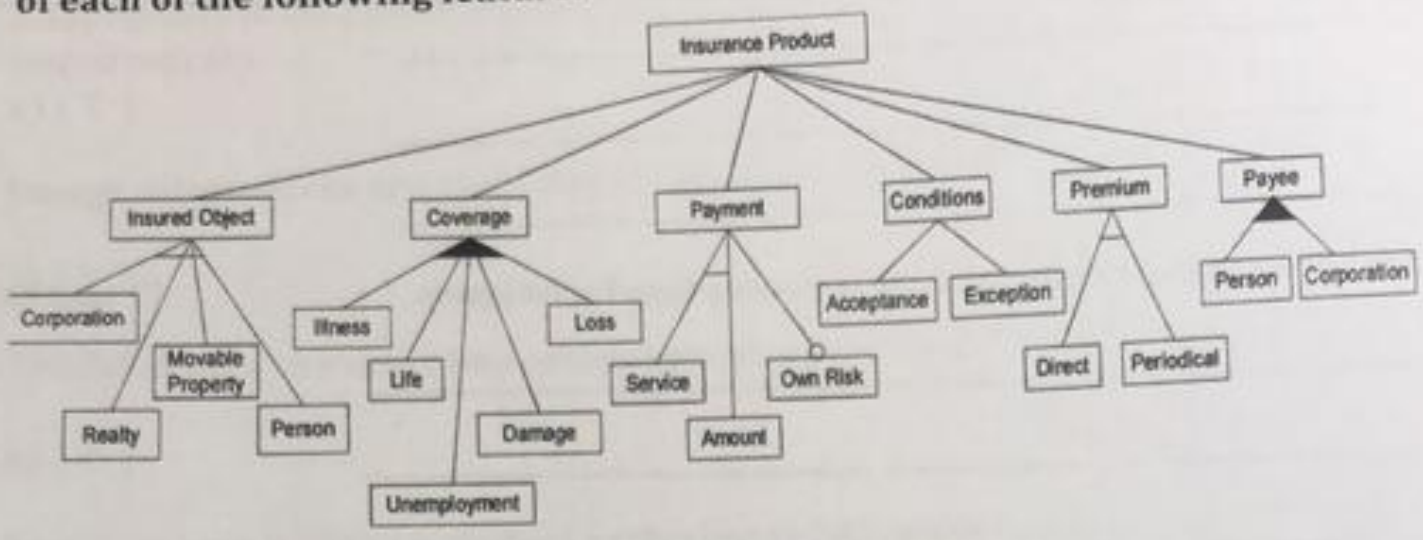
10. ~~Use-case~~ (Context) diagram shows what is in and what is out the systen consideration and how it interacts with the outside world.
    a) (T) b) (F)

Go To next page →

[10 Marks]

Question 4

A) Consider the following feature diagram of insurance system then find the type of each of the following feature: [6 marks]



1- Conditions- Acceptance; Conditions-Exception: Mandatory

2- Payment- Own Risk: Optional

3- Insured Object – Person; Insured Object- Realty: Alternative

4- Coverage-lose and Coverage-life: Or - Feature

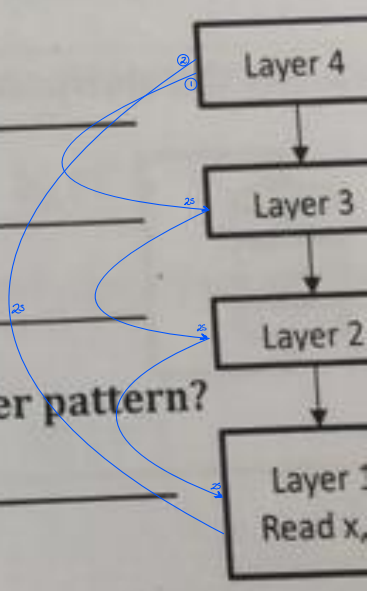
5- What is the relation between the two features:

Insured Object-Realty and Coverage-Illness: Insured Object.Realty Mutex - with Coverage Illness

6- What is the relation between the two features:

Coverage-Illness and Insured Person: Corerage.Illness Requires Object Insured.Preson

B) The opposite figure shows a layer-pattern based software which consists of 4 layers. IF the request or notification from layer to another layer takes two second compute the performance (in second) of performing the request sent by layer 4 to get the value of x and y if the system is: [4 mark



1- Restricted layers pattern: 6s

2- Relaxed layers pattern: 2s

3- What is the type of this request? Top - down

4- What is the type of communications between layers in layer pattern? Interface

End of Questions

Question 1

[10 Mark

In each of the following, choose the correct answer among a- d. (TICK ONLY ONE)

1. According to the IEEE definition of Software architecture, it consists of:

a) components, relationships among them and design and evolution principles

b) components, relationships between them and environment.

c) (a) and (b)

d) None

2. The key difference between Software architecture and Software design is:

a) architecture has more details than design

b) design has more details than architecture

c) architecture has many views but design has one design alternative

d) architecture has one view but design has many design alternatives

3. Which of the following can influence the software architecture

a) Stakeholders

b) Technical Environment

c) Architect's experience

d) All the previous

4. Architectural Modeling can be

a) Visual UML

b) Textual ADLs

c) (a) and (b)

d) None

5) UML can be applied to model architectures:

a) As it is

b) Using extension mechanisms

c) Introducing new notations

d) All the previous

6) Software Product-line Architecture uses ---------- method

a) Multi-system design

b) Single-system design

c) (a) and (b)

d) None

7) Software Architecture design methods can be classified according to source:

a) Artifact-driven and Use case-driven

b) Pattern-driven and Domain-driven

c) (a) and (b)

d) None

8) The sources of requirements are

a) Stakeholders

b) domain

c) (a) and (b)

d) None

9) Usability is

a) Functional requirements

b) External quality requirements

c) Internal quality requirements

d) None

10) The prioritization of the requirement that will be supported at some stage, but not necessary in the first/next release is

a) Conditional

b) Essential

c) Optional

d) None

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ion 2

gn which of the following is True (T) and which is False (F). **[15 Marks]**

1. A domain includes set of knowledge sources from which the various domain concepts can be derived. (✓)
2. Any set of knowledge sources for a domain can be prioritized. (X)
3. In ATM, withdrawing and depositing money are optional features. (X)
4. Design alternatives are caused by the quality concerns of the stakeholder. (✓)
5. The design alternative that considers the performance uses number of Classes relatively more than the design alternative which considers the adaptability. (X)
6. In one design, some parts of the system can consider the time performance, other pats can focus on reuse, and other parts can be adaptable. (X)
7. A design alternative can satisfy the availability as well as the safety. (X)
8. An architecture is organized into only one view of the system. (X)
9. Each view addresses only one concern of the stakeholder. (X)
10. Continuously, a unique pattern is enough to represent the demand requirements. (X)
11. Pipes and Filters pattern is fit with a mix of low- and high-level issues, where high-level operations rely on low level issues. (X)
12. In layers pattern, each layer contains only one entity of the system. (X)
13. Relaxed Layered pattern improves the maintainability and reduces the performance. (X)
14. Pipes and Filters pattern consists of sequence of dependent processing steps. (X)
15. Sensor or camera is a good example for data source in monitoring system that designed by pipes and filters pattern. (X)

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Question 3

A) Fill in the following with the correct concepts. (3 marks)

1. In Pipes and Filters pattern, ... Filter ..... represent the architecture components and ..... Pipes ..... represent the relations between them.
2. In layers pattern, ... Layer Entity ..... represent the architecture components.
3. Operating systems are designed using ..... Layers ..... pattern, while compilers are designed using ..... Pipes and Filter ..... pattern.
4. View is a representation of a system from the perspective of one or more ..... concerns which are held by one or more stakeholders .....

B) In the following figure, insert Filter 3 between Filter 2 and data sink and redraw the figure according to that and answer the following. [2 marks]

1- What is the scenario given in the figure? [1 mark]

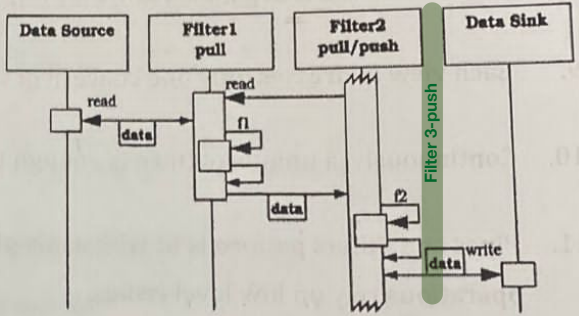
.....Pull and Push.....

2- Which component will start the process? [1 mark]

.....Filter 2.....

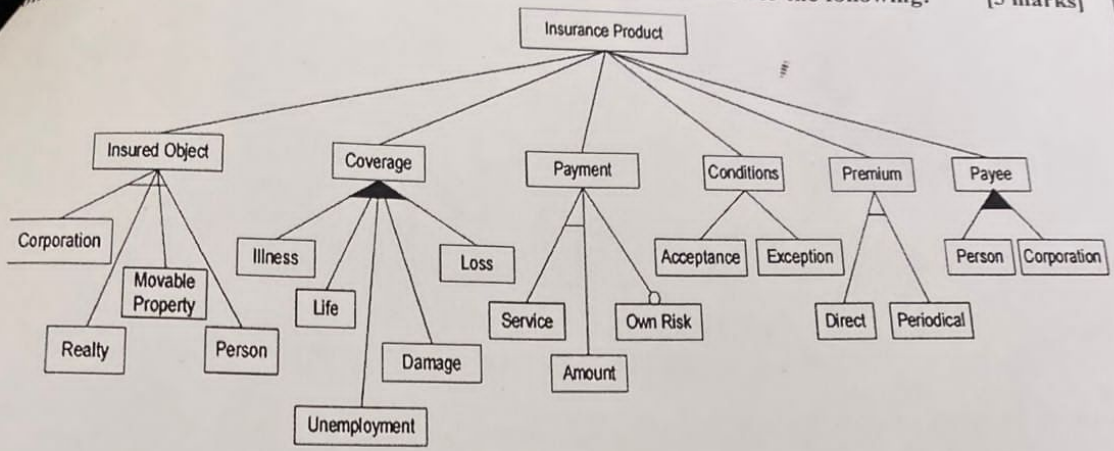
3) Does Filter 3 pull, push or pull/push the data? [1 mark]

.....Push.....



[5 Marks]

Consider the following feature diagram of insurance system then answer the following: [5 marks]



A) Find the type of each of the following three feature:

1- Conditions- Acceptance; Conditions-Exception: ..... Mandatory .....

2- Insured Object – Person; Insured Object- Realty: ..... Alternative .....

3- Coverage-lose and Coverage-life: ..... Or - Feature .....

B) What is the relation between each two features given below?

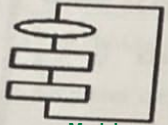
1- Insured Object- Realty **and** Coverage-Illness.

..... Mutex - with .....

2- Coverage-Illness **and** Insured Person.

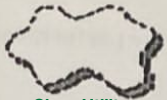
..... Requires .....

5. Write the view of each of the following notations? [2 marks]



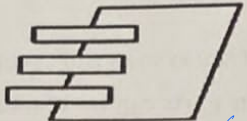
Module

[Dev. Viewpoint - Notation.....]



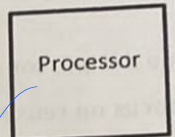
Class Utility

[Logical Viewpoint - Notation.....]



Process

[Process Viewpoint - Notation.....]



[Physical Viewpoint - Notation.....]