

Architectural Design

high-level architectural view of a system is useful for

- A. communication with system stakeholders
- B. Large scale re-use
- C. system analysis
- ☒ D. All of the mentioned

The architecture of a compiler can best be implemented using:

- A. client to server model
- B. repository model
- ☒ C. pipe-and-filter model
- D. all of the above

Which of the following is not included in Architectural design decisions?

- A. type of application ✓
- B. distribution of the system ✓
- C. architectural styles ✓
- ☒ D. testing the system

Which of the following represents application architectures?

- A. Transaction processing applications
- B. Language processing systems
- C. Client management systems
- ☒ D. Both (A) and (B)

Which of the following view shows that the system is composed of interacting processes at run time?

- A. physical
- B. development
- C. logical
- ☒ D. process

A view shows the system hardware and how software components are distributed across the processors in the system.

- ☒ A. physical
- B. logical
- C. process
- D. all of the above

..... to Shows how the software is decomposed for development
(Layered Pattern - Model-View-Controller - Repository Pattern - Development View)

Answer : **Development View**

..... should include information about when they are useful
(pattern-use case-activity)

Answer: **pattern**

A repository pattern has

- A. High impact on the availability of the interconnected systems.
- B. efficient data sharing mechanisms
- C. central database
- ☒ D. All of the mentioned

Which of the following is/are commonly used architectural pattern(s)?

- A. Model-View-Controller
- B. Layered Architecture
- C. Client-server
- ☒ D. All of the mentioned

MVC stands for

- A. Model versioning control ✕
- ☒ B. Model view control
- C. Model visual control ✕
- D. Model viewer control ✕

Which of the following pattern is the basis of interaction in many web-based systems?

- A. architecture
- B. repository pattern
- ☒ C. model-view-controller
- D. none of the mentioned

A set of interacting components can share data using the

- A. model-view-controller
- B. architecture pattern
- ☒ C. repository pattern
- D. none of the mentioned

- Is Components can be independent, they do not need to know of the existence of other components

(Client-Server Pattern - Layered Pattern - Layered Pattern - Repository Pattern)

Answer : Repository Pattern

..... Is Organizes the system into layers with related functionality associated with each layer.

(Layered Pattern - Architectural Design - Model-View-Controller - Repository Pattern)

Answer : Layered Pattern

-is a way of reusing abstract knowledge about a problem and its solution.

(design pattern - Layered Pattern - Layered Pattern - Repository Pattern)

Answer : design pattern

Testing

Which test refers to the retesting of a unit, integration and system after modification, in order to confirm that the applied changes have not caused new faults?

- ☒ A. Regression Test
- B. Smoke Test
- C. Alpha Test
- D. Beta Test

Which of the following is not a part of a test design document?

- A. Test Plan
- B. Test Design Specification
- C. Test Case Specification
- ☒ D. Test Log

What is meant by V&V in software testing?

- A. Verified Version
- B. Version Validation
- ☒ C. Verification and Validation
- D. Version Verification

The best way to conduct a requirements validation review is to

- a) examine the system model for errors
- b) have the customer look over the requirements
- c) send them to the design team and see if they have any concerns
- ☒ d) use a checklist of questions to examine each requirement

- The first goal of testing leads to

(validation testing - defect testing)

Answer : validation testing

- The second goal of testing leads to

(validation testing - defect testing)

Answer : defect testing

48- we do To demonstrate to the developer and the system customer that the software meets its requirements

(validation testing - defect testing)

Answer : validation testing

- we do To discover faults or defects in the software where its behaviour is incorrect or not in conformance with its specification

(Validation testing - Defect testing)

Answer : defect testing

- A successful test of shows that the system operates as intended.

(validation testing - defect testing)

Answer : validation testing

- A successful test of is a test that makes the system perform incorrectly and so exposes a defect in the system.

(Validation testing - Defect testing)

Answer : defect testing

- building the product right mean

(Verification – Validation)

Answer : Verification

- building the right product mean

(Verification – Validation)

Answer : Validation

Which testing type checks the behaviour of module cooperation?

A. Unit Testing

☒ B. Integration Testing

C. Acceptance Testing

D. Regression Testing

What are the various testing types?

A. Unit Testing

B. System Testing

C. Integration Testing

☒ D. All of the mentioned

Alpha testing is done at

☒ A. Developer's end

B. User's end

C. Developer's & User's end

D. None of the mentioned

Which of the following is a purpose of testing:

a-detect bugs in code b- find faults c-analyse performance
mentioned

d-all of the

-used where a separate testing team test a complete version of the system before it is released to users.

(Development testing - Release testing - User testing)

Answer : Release testing

-used where users or potential users of a system test the system in their own environment.

(Development testing - Release testing - User testing)

Answer : User testing

- where individual program units or object classes are tested

(Unit testing - Component testing - System testing)

Answer : Unit testing

-Concerned with analysis of the static system representation to discover problems(static verification)

(Software inspections - Software testing)

Answer : Software inspections

-..... Concerned with exercising and observing product behaviour (dynamic verification)

(Software inspections - Software testing)

Answer : Software testing

Software Evolution

-The stage in a software system's life cycle where it is in operational use and is evolving as new requirements are proposed and implemented in the system mean

(Evolution – Servicing - Phase-out)

Answer : Evolution

- At this stage, the software remains useful but the only changes made are those required to keep it operational No new functionality is added.

(Evolution – Servicing - Phase-out)

Answer : Servicing

- The software may still be used but no further changes are made to it.

(Evolution – Servicing - Phase-out)

Answer : Phase-out

Which of the following represents application architectures?

Select one:

- ☐ a. Client management systems
- ☒ b. Transaction processing applications and Language processing systems
- ☐ c. Language processing systems
- ☐ d. Transaction processing applications

محاضرة الاسبوع السابع
بالموديل

Project management

Large software projects are considered 'one-off' projects which means:

- A. Projects occur only once and never be repeated
- ☒ B. Large software projects are different from previous projects
- C. They require one team only
- D. d- None of the above

All of the following are parts of a project plan except:

- A. Introduction
- B. project organization
- C. project timelines
- ☒ D. Software requirements

All of the following are examples of software project risks EXCEPT:

- ☒ A. Policy risks
- B. Technology risks
- C. People risks
- D. organizational risks

Project management activities may include:

- A. Resources Scheduling
- B. Financial reporting
- C. Risks identification
- ☒ D. All of the mentioned

Which of the following is Project Planning stage?

- ☒ A. Proposal stage
- B. Procurement stage
- C. iteration sign-off stage
- D. Financial stage

Which of the following is not a Risk consequence?

- A. catastrophic ✓
- ☒ B. unbelievable
- C. Serious ✓
- D. All of the mentioned ✗

Risk consequences might be

- ☐ a. Serious
- ☒ b. All of the mentioned
- ☐ c. catastrophic
- ☐ d. predictable

While managing people, a project manager should take into account which of the following needs of his team:

- A. Basic needs
- B. Personal needs
- C. Social needs
- ☒ D. all the above

which of the following is a risk identification activity?

- ☒ A. Identify project, product and business risks;
- B. Assess the likelihood and consequences of these risks;
- C. Draw up plans to avoid or minimise the effects of the risk;
- D. Monitor the risks throughout the project;

Which of the following is a reuse planning factor?

Select one:

- ☐ a. none of the mentioned
- ☒ b. The execution platform for the software
- ☐ c. Programming libraries
- ☐ d. Application architecture

Which of the following is a product breakdown structure practice in assigning activities to work packages in a software project?

Select one:

- ☐ a. None of the mentioned
- ☐ b. Work packages are classified according to work needs to be done
- ☐ c. Work packages are classified according to either product or work.
- ☒ d. Work packages are classified according to products needs to be produced

Which of the following is work breakdown structure practice in assigning activities to work packages in a software project?

Select one:

- ☐ a. Work packages are classified according to products needs to be produced
- ☐ b. Work packages are classified according to either product or work.
- ☒ c. Work packages are classified according to work needs to be done
- ☐ d. None of the mentioned

Which of the following can be considered as a project milestone?

- ☐ a. design walkthrough
- ☐ b. Test plan document
- ☒ c. handover of the system for testing
- ☐ d. requirements document

While managing people, a project manager should take into account which of the following needs of his team:

Select one:

- ☐ a. Social needs (e.g. to be accepted as part of a group).
- ☒ b. all the above
- ☐ c. Personal needs (e.g. respect, self-esteem);
- ☐ d. Basic needs (e.g. food, sleep, etc.);

محاضرة الاسبوع الثامن و التاسع
بالموديل

20) Approaches that support software re-use are:

- A. Service-oriented systems
- B. Software product lines
- C. COTS product reuse
- ~~D.~~ all of the above

Some software engineers prefer to **reject software re-use** principle because they trust only their created software. This is known as:

Select one:

- ☐ a. None of the above
- ☐ b. Not-created here principle
- ☒ c. **Not-invented-here syndrome**
- ☐ d. Not-found here syndrome

محاضرة الاسبوع العاشر
بالموديل

The decision on whether to use an agile or a plan-driven approach to development depends mainly on:

- ☒ A. Software requirements
- B. the execution platform for the software
- C. the capabilities of the team
- D. the desire of the company developing the system.

Large organizations are incompatible with agile methods because of:

- A. inhouse quality procedures
- B. inhouse standards
- C. Culture
- ☒ D. all of the above

Class diagrams show

- A. Interactions between a system and environment. Use Case
- ☒ B. the object classes in the system
- C. How the system reacts to internal and external events. state
- D. None of the above

Use case diagrams show

- a- the interactions between a system and its environment.
- b- the object classes in the system class
- c- how the system reacts to internal and external events. status
- d- None of the above

In Scrum, the daily meeting is referred to as:

- A. Sprint
- ☒ B. product backlog
- C. sprint retrospective
- ☒ D. Scrum

In Scrum, the work to be done is referred to as:

- a- Sprint
- b- product backlog
- c- sprint retrospective
- d- Daily meeting

All of the following is a Scrum artefact except:

- a- Product Backlog
- b- Sprint Backlog
- c- Story
- d- Increment

UML may be used to define business process models.

- a- Class diagrams
- b- activity diagrams
- c- state diagrams
- d- none of the above

UML activity diagrams may be used to define:

- A. Classes
- B. business processes
- C. states
- ~~D. none of the above~~

Large organizations are incompatible with agile methods because of:

- a- inhouse quality procedures
- b- inhouse standards
- c- Culture
- d- all of the above

Agile development sounds incompatible with

- a- legal contracts
- b- maintaining existing software systems
- c- Worldwide distributed teams
- d- all of the above

Agile development is not compatible with

- A. legal contracts
- B. maintaining existing software systems
- C. Worldwide distributed teams
- D. all of the above

Agile methods focus on:

- A. Software refactoring
- B. Infrequent releases of the software.
- C. software documentation
- (D.) none of the above

Scrum consists of phases

- a) one b) two **c) three** d) none of the mentioned

In XP, System increments are released to customers every..... weeks.

- a) One **b) Two** c) Three d) Four

14) In XP, user requirements are expressed as.....

- a) Implementation tasks b) functionalities **c) scenarios**
d) none of the above

15) Implementing large systems using agile methods can fail because:

- a) Development teams are working in different places, sometimes in different time zones.
b) Large systems are collection of existing systems.
c) (a) and (b)
d) None of the mentioned

16) In UML, what term describes a customer ordering books via the web?

- a) External system
b) Subject
c) User
d) Actor

17) In UML, what is the behaviour of an object caused by?

- a- An operation** b- An event c- A trigger d- A call

18) Ten employees in a department can submit an expense form to have their expenses repaid. The manager is required to approve the expense forms. How many actors have we described?

- a- 1 actors b- 10 actors **c- 2 actors** d- 12 actor

20) Requirements models depict software in which three domains?

- a) architecture, interface, component b-cost, risk, schedule
c- information, function, behavior d-None of the above

21) The software system specification describes the

- a)** Function, performance and constraints of a computer-based system
b) implementation of each allocated system
c) element software architecture
d) time required for system simulation

Part II - STATE WHETHER THE FOLLOWING STATEMENTS ARE TRUE OR FALSE (18 marks)

- 1) Model-driven engineering is just a theoretical concept. It cannot be converted into a working/executable code. *T*
- 2) Agile methods seem to work best when team members have a relatively high skill level. *T*
- 3) In XP, developers work individually on a release. *F*
- 4) Software refactoring is the process of continuous testing of the system to enhance its performance and modularity. *T*
- 5) Software lifecycle starts when a software product is released and ends when the product is no longer available. *T*
- 6) Waterfall model is the most effective model for software development. *F*
- 7) Software Engineering is concerned not only with software production but also with organizations processes. *T*
- 8) In a RUP model we agree on the objectives in the inception phase.
- 9) A Plan-driven process cannot be changed. *T*
- 10) Software systems can be of generic nature only. *F*
- 11) The cost of re-engineering is often significantly less than the costs of developing new software. *F*
- 12) Prototypes should be discarded after development as they are not a good basis for a production system. *T*
- 13) Most software development projects are initiated to try to meet some business need. *T*
- 14) Software process is a structured set of activities required to develop software systems. *T*
- 15) Software processes can be constructed out of pre-existing software patterns to best meet the needs of a software project. *T*
- 16) Software validation is achieved through a series of tests performed by the user once the software is deployed in his or her work environment. *F*
- 17) In agile process models' requirements engineering and design activities are interleaved. *T*
- 18) Software design model should be traceable to the requirements model. *T*

(End of Questions – Good Luck)



Assoc.Prof.Dr. Amr Thabet

Part II State whether the statements are True or False (30 points)

1. In Extreme Programming, tests are automated. **T**
2. In XP, developers work individually on a release. **F**
3. Acceptance & system test planning are a part of architectural design activities **F**
4. Properties of a system such as performance and security are independent of the architecture used. **F**
5. Verification refers to the set of tasks that ensure that software correctly implements a specific function. **T**
6. Model-driven engineering is just a theoretical concept. It cannot be converted into a working/executable code. **F**
7. Agile methods seem to work best when team members have a relatively high skill level. **T**
8. Activity diagrams are used to model the processing of data. **T**
9. In XP, as soon as the work on a task is complete, it is integrated into the whole system. **T**
10. In a model-driven engineering process, we can generate system code from the system model. **T**
11. Social and organizational issues have no effect on system boundaries. **F**
12. System modeling is the process of developing abstract models of a system **T**
13. A complete agile approach to requirements engineering is possible **F**
14. Models can be used to explain system requirements only **F**
15. System modelling helps the analyst to understand the functionality of the system. **T**
16. IDE stands for Interactive Design Environments. **F**
17. Architectural design is the process for identifying the sub-systems making up a system. **T**
18. A high-level architectural view of a system is useful for communication with system stakeholders and project planning **T**
19. A repository pattern has low impact on the availability of the interconnected systems. **F**
20. Object identification relies mainly on the skill, experience and domain knowledge of system designers. **T**

(End of Exam - Good Luck)

A.Prof. Amr Thabet

Amr Thabet

Architectural design is the process for identifying the sub-systems making up a system

Select one:

- ☐ a. False
- ☒ b. True

A high-level architectural view of a system is useful for communication with system stakeholders and project planning

Select one:

- ☐ a. False
- ☒ b. True

Pipe and filter architecture is commonly used to interconnect web applications

Select one:

- ☒ a. False
- ☐ b. True

MVC stands for model versioning control

Select one:

- ☒ a. False
- ☐ b. True

Verification refers to the set of tasks that ensure that software correctly implements a specific function.

Select one:

- ☒ a. True
- ☐ b. False

A repository pattern has low impact on the availability of the interconnected systems

Select one:

- ☒ a. False
- ☐ b. True

IDE stands for Interactive Design Environments.

- ☐ a. True
- ☒ b. False

Modelمش علينا ال

System modeling is the process of developing abstract models of a system

Select one:

- ☒ a. True
- ☐ b. False

System modelling helps the analyst to understand the functionality of the system

Select one:

- ☒ a. True
- ☐ b. False

Models can be used to explain system requirements only

Select one:

- ☐ a. True
- ☒ b. False

Models can be used to explain system requirements only

Select one:

- ☒ a. False
- ☐ b. True

In a model-driven engineering process, we can generate system code from the system model.

Select one:

- ☐ a. False
- ☒ b. True

Model-driven engineering is just a theoretical concept. It cannot be converted into a working/executable code.

Select one:

- ☐ a. True
- ☒ b. False

Activity diagrams are used to model the processing of data.

Select one:

- ☒ a. True
- ☐ b. False

COTS stands for Computer Oriented Technology Systems.

Select one:

- ☒ a. False
- ☐ b. True

In Extreme Programming, tests are automated.

Select one:

- ☒ a. True
- ☐ b. False

Social and organizational issues have no effect on system boundaries.

Select one:

- ☒ a. False
- ☐ b. True

Usually application servers are installed in tiers where all are hosted on the same network segment.

Select one:

- ☐ a. True
- ☒ b. False

Landline phone switching system are event-driven

Select one:

- ☒ a. True
- ☐ b. False

Load-balancing is only useful with geographically distributed application servers

Select one:

- ☒ a. False
- ☐ b. True

Object identification relies mainly on the skill, experience and domain knowledge of system designers.

Select one:

- ☐ a. False
- ☒ b. True

Properties of a system such as performance and security are independent of the architecture used.

Select one:

- ☐ a. True
- ☒ b. False

A complete agile approach to requirements engineering is possible

Select one:

- ☐ a. True
- ☒ b. False

In XP, as soon as the work on a task is complete, it is integrated into the whole system.

Select one:

- ☐ a. False
- ☒ b. True

In XP, developers work individually on a release.

Select one:

- ☒ a. False
- ☐ b. True

Object identification relies mainly on the skill, experience and domain knowledge of system designers.

Select one:

- ☐ a. False
- ☒ b. True

- 1- An object-oriented system model to show the classes in a system and the associations between these classes is Use Case Diagrams
(F) ***Class Diagram**
- 2- Show how the system reacts to internal and external events is State Diagrams
(T)
- 3- Established to define what is inside and what is outside the system that is System Boundaries
(T)
- 4- model is meant to be a complete representation of a system
(F) ***it purposely leaves out detail to make it easier to understand.**
- 5- Shows the system hardware and how software components are distributed across the processors in the system that is Layered Architectural Pattern
(F) ***Physical View**
- 6- Can involve additional code and code complexity when the data model and interactions are simple that is MVC
(T)
- 7- Pipe and Filter pattern be used in data processing applications where inputs are process in separate stages to generate related outputs.
(T)
- 8- Most software is developed on one computer (the host), but runs on a separate machine (the target).
(T)
- 9- Program testing Can reveal the presence of errors NOT their absence.
(T)
- 10-Aim of V & V is to establish confidence that the system is" 'fit for purpose"
(T)
- 11-Depends on system's purpose, user expectations and marketing environment
(T)
- 12-Inspections not require execution of a system so may be used before implementation.
(T)

13-Inspections and testing are complementary and not opposing verification techniques.

(T)

14-Inheritance makes it more difficult to design object class tests as the information to be tested is not localised.

(T)

15-Whenever possible, unit testing should be automated so that tests are run and checked without manual intervention by Automated testing

(T)

16-assertion part in Automated testing If the assertion evaluates to true, the test has been successful if false, then it has failed.

(T)

11- Social and organizational concerns not affect the position system boundaries

(F)

12- In system boundaries we know what is inside and outside the system

(T)

13- Interaction model is important as it helps to identify user requirement

(T)

17- Architecture in small concerned with program

(T)

18- Architecture in the large is concerned with the architecture complex system

(T)

23- Pattern may be represented using tabular and graphical description

(T)

24- Disadvantage of MVC pattern is additional code

(T)

Subject :	Elective course (5) – Advanced Topics on Software Engineering	Level : Fourth Year	
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Final-Term Examination- Second Semester 2013/2014		Code : CSE 3424	

Q1 (15 marks)

Specify whether the following statements are true or false and correct on the wrong statements

- ✓ a- Transaction processing systems are interactive systems that allow information in the web to be remotely accessed and modified.
- ✗ b- IDE stands for Interactive Design Environments.
- ✓ c- Architectural design is the process for identifying the sub-systems making up a system.
- ✓ d- A high-level architectural view of a system is useful for communication with system stakeholders and project planning.
- ✗ e- MVC stands for model versioning control.
- ✗ f- A repository pattern has low impact on the availability of the interconnected systems
- ✓ g- Usually application servers are installed in tiers where they are hosted on different network segments.
- ✗ h- Rapid development is efficient in large system projects only.
- ✓ i- Pipe and filter architecture is commonly used in Transaction processing systems.
- ✓ j- Architecture Patterns should include information about when they are and when they are not useful.