UNIVERSITY OF FORT HARE

University of Fort Hare

Together in Excellence

Degree Examinations November 2018

CSC324: Software Engineering

Time: 3 Hours **Marks: 100**

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Instructions:

- There are **five (5)** pages in this assessment paper, including the cover page.
- There are **five (5)** questions in this assessment, answer all questions.
- Write neatly and clearly.
- NO CALCULATORS and CELLPHONES allowed in this assessment.
- Number your answers correctly as indicated in each question.
- Read the question carefully before you attempt to answer.
- Attempt ALL the questions.

Question One (10 marks)

1.1. Which of the following task is not part of risk management process?

A. Risk Specification
B. Risk Testing
C. Risk Monitoring
D. Risk Avoidance

1.2. When do we use Use Cases?

A. To identify user interface
B. To clarify user requirements
C. To identify users's goal
D. All of the above

1.3. Which of the following questions help us identify actors in writing our use cases?

A. Who gets information from this system?
B. Who provides information to the system?
C. What other systems use this system?
D. All of the above

1.4. Which of the following is a feature of good software?

A. Extensibility
B. Complexity
C. Efficient
D. None of the above

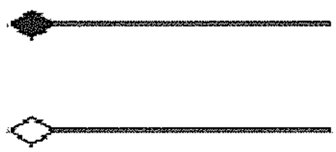
1.5. UML activity diagrams are useful in representing which analysis model elements?

A. Behavioral elements
B. Class-based elements
C. Flow-based elements
D. Scenario-based elements

1.6. What are the major activities of the spiral model of software engineering?

A. Requirements Definition and Specification, System and Software Design, Programming and Unit Testing, Integration and System Testing, Maintenance.
B. Planning, Analysis, Design, Testing, Maintenance.
C. Planning, Risk Analysis, Engineering, Customer Evaluation.
D. Quick Design, Build Prototype, Evaluate Prototype, Refine Prototype.

1.7. What type of core-relationship is represented by the symbols in the figure below?



A. Aggregation and Dependency
B. Association and Composition
C. Aggregation and Composition
D. Association and Dependency

1.8. Risk analysis is conducted during the:

A. System Analysis phase
B. Feasibility study
C. System Planning phase
D. System Maintenance phase

1.9. One of the following examples is NOT a risk involved in software development.

A. Wrong time estimation and schedule.
B. Continuous changing of user and/or system requirements.
C. Changing customer product strategy and priority.
D. None of the above.

1.10. How does a software project manager need to act to minimize the risk of software failure?

A. Double the project team size.
B. Request for more period of time.
C. Request a large budget.
D. Track progress through milestones.

Question Two: True or False (10 marks)

2.1. In software engineering, the detailed study of an existing system is referred as a feasibility study.
2.2. When eliciting requirements, one has to consider those both inside and outside the system and context boundaries.
2.3. Software reliability is a function of the number of failures experienced by a particular user of that software.
2.4. Spiral model is an incremental software development process model that emphasizes an extremely short development cycle.
2.5. During the software testing process, integration testing is performed after unit testing.

Question Three (31 marks)

3.1. Describe the verification and validation steps of a software process. [4]
3.2. You have successfully developed a "good" software or system for your client/customer. List and explain five (5) important features of your developed software or system that classifies it a good software or system. [5]
3.3. List and explain any five (5) important points to consider when deciding on a software process. [5]
3.4. Differentiate between functional and non-functional system requirements. Provide an example for your answer. [6]
3.5. What is a design pattern? Explain the Client/Server design pattern with an example.

[3]

3.6. Describe a use case and its purpose. [4]

3.7. When do we use the "extend" relationships between use cases? Explain your answer with example. [4]

Question Four (24 marks)

4.1. Match each lifecycle model with its definition: [5]

a) Code-and-fix	A. Assess risks at each step; do most critical action first
b) Evolutionary prototyping	B. build an initial small requirement spec, code it, then "evolve" the spec and code as needed
c) Spiral	C. Build initial requirement specs for several releases, then design-and-code each in sequence
d) Staged delivery	D. standard phases (requirements, design, code, test) in order
e) Waterfall	E. write some code, debug it, repeat (i.e. ad-hoc)

4.2. What is configuration management? What are the fundamental activities performed? Explain at least three (3) activities. [6]

4.3. Explain with a drawing what a Model View Controller pattern is? Explain also its different components. [7]

4.4. Describe the distinction between OOA, OOD, and OOP. [6]

Question Five (25 marks)

5.1. Draw a UML Class Diagram representing the following elements from the problem domain for a hockey league. A hockey league is made up of at least four hockey teams. Each hockey team is composed of six to twelve players, and one player captains the team. A team has a name and a record. Players have a number and a position. Hockey teams play games against each other. Each game has a score and a location. Teams are sometimes lead by a coach. A coach has a level of accreditation and a number of years of experience, and can coach multiple teams. Coaches and players are people, and people have names and addresses. Draw a class diagram for this information, and be sure to label all associations with appropriate multiplicities. [15]

5.2. Consider the following Use Case for Order Processing.

"When we receive an order, we check each line item on the order to see if we have the goods in stock. If we do, we assign the goods to the order. If this assignment sends the quantity of those goods inn stock below the reorder level, we reorder the goods. While we are doing this, we check to see if the payment is OK. If the payment is OK and we have the goods in stock, we dispatch the order. If the payment is OK but we don't have the goods, we leave the order waiting. If the payment isn't OK, we cancel the order."

Draw an activity diagram for the above use case. [10]