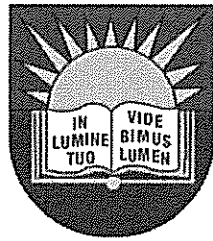


UNIVERSITY OF FORT HARE



University of Fort Hare
Together in Excellence

Supplementary Examinations January 2019

CSC324: Software Engineering

Time: 3 Hours

Marks: 100

Internal Examiner
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External Examiner
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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 is a feature of good software?

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

1.2. 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

1.3. 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.

1.4. 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

1.5. In the Unified Process, requirements are described by:

- A. Design model
- B. Domain model
- C. Use case model
- D. All of the above

1.6. Risk analysis is conducted during the:

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

1.7. The model stipulates that the requirements be completely specified before the rest of the development can processed.

- A. Waterfall
- B. Rapid Application Development
- C. Iterative Development
- D. Incremental Development

1.8. 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.

1.9. 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.

1.10. The aim of software engineering is to produce software that is:

- A. Delivered on time
- B. Delivered within budget.
- C. Satisfies user's needs.
- D. All of the above.

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

(30 marks)

- 3.1. How do you estimate cost required for a software development project? [4]
- 3.2. List and explain any five (5) important points to consider when deciding on a software process. [5]
- 3.3. List and describe any four (4) activities of requirement engineering process. [4]
- 3.4. Differentiate between functional and non-functional system requirements. [4]
- 3.5. Explain with a drawing what a Model View Controller pattern is? Explain also its different components. [7]
- 3.6. Describe the distinction between OOA, OOD, and OOP. [6]

Question Four

(20 marks)

4.1. Match each lifecycle model with its definition:

[10]

| | |
|-----------------------------|--|
| 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 in detail what is verification and validation.

[4]

Question Five

(30 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. Draw a UML Activity Diagram describing behavior of the Purchase Ticket use case of a Ticket Vending Machine. The activity should be started by Commuter actor who needs to buy a ticket. Ticket vending machine will request trip information from Commuter. This

information will include number and type of tickets, e.g. whether it is a monthly pass, one way or round ticket, route number, destination or zone number, etc. Based on the provided trip info ticket vending machine will calculate payment due and request payment options. Those options include payment by cash, or by credit or debit card. If payment by card was selected by Commuter, another actor, Bank will participate in the activity by authorizing the payment.

[15]