Carleton UNIVERSITY
Canada's Capital University

School of Information Technology
NET 3009 – Software Engineering
October 27, 2009

Student Name:_____ Student #: _____

Midterm Exam – 60 minutes

Closed book. 100 points total. Answer all questions.

1 Multiple-choice questions. (3 points each)

1) Which of the following attributes is NOT an important attribute that good software products should have?
(a) Dependability (b) Efficiency (c) Heterogeneity (d) Maintainability

2) The associated documentation is part of the software.
(a) TRUE. (b) FALSE.

3) A software process model represents a software process from all different perspectives.
(a) TRUE (b) FALSE

4) Which of the following activities is NOT a basic software process activity?
(a) Specification (b) Development (c) Validation (d) Proposal writing

5) Which of the following is NOT an advantage for the waterfall software process model?
(a) This model fits with other traditional engineering process models.
(b) Documentation is produced at each phase.
(c) It has process visibility.
(d) It is easy to respond to changing customer requirements.

6) Which of the following is an advantage for the evolutionary development software process model?
(a) Meet the immediate needs of customers for small or medium-size interactive systems.
(b) Systems are often well structured
(c) It is easy to establish a stable system architecture for a very large system.
(d) It has process visibility.

7) Which of the following activities is not a basic activity in the component-based software process model?
(a) Requirement analysis. (b) Risk analysis. (c) System design. (d) System integration.

8) Which of the following is a problem for incremental delivery of software product?
(a) Higher risk of overall project failure.
(b) It is not easy to map customer's requirement onto increments of the right size.
(c) The highest priority system services tend to receive the most testing.
(d) Early increments cannot help elicit requirements for later increments .

9) Which of the following software process models has the explicit recognition of risk?

(a) Waterfall (b) Spiral development (c) Component-based software engineering (d) Incremental delivery

10) Which of the following requirements is high-level abstract requirement?

(a) Functional requirement (b) Non-functional requirement (c) User requirement (d) System requirement

11) Which of the following requirements is a non-functional requirement for a router?

(a) It shall be able to handle more than 100k packets per second. (b) It shall support IGRP routing protocol. (c) It shall support InterVLAN routing. (d) The user shall be able to check the status of the ports.

12) Which of the following requirements is a functional requirement for a switch?

(a) The time to restart after failure shall not be more than 20 seconds. (b) It should support IEEE 802.1Q trunking protocol. (c) The probability of unavailability shall be less than 0.01%. (d) The power consumption shall be less than 50 Watts.

13) UML is specifically designed for C++ programming language.

(a) TRUE (b) FALSE

14) Each UML diagram is designed to let developers and customers view a software system from a different perspective.

(a) TRUE (b) FALSE

15) Which of the following diagrams is NOT a behavior diagram?

(a) Context diagram (b) Use case diagram (c) State machine diagram (d) Sequence diagram

16) Which of the following diagrams is a structure diagram in UML?

(a) Use case diagram. (b) Class diagram. (c) State machine diagram. (d) Sequence diagram.

17) Use cases can be used to represent non-functional requirements of a system.

(a) TRUE (b) FALSE

18) In UML, which of the following use case relationships is useful for dealing with special cases?

(a) Generalization (b) Extend (c) Include (d) Specialize

19) Data flow diagrams model the system from a non-functional perspective.

(a) TRUE (b) FALSE

20) Which of the following models is useful in illustrating what lies outside the system boundaries?

(a) State machine model (b) Context model (c) Use case model (d) Data flow model

2 Assume that you need to develop a network monitoring system that replaces the existing one. The system can generate network maps using data collected from network nodes such as routers and switches. Network nodes transmit their data to the central server after receiving a request from the server. The data shall include the status (ON or OFF) of the network node. A map is created in the central server according to the received data. The user can access the central server from a remote client. The user can either check the map of the network or configure the map (e.g., which network nodes shall be included in the map). After checking the map, the user can print the map. The system will ask for the password if the user wants to do configuration. The password can be changed by the user.

Know each of the diagrams and how to draw them... picking the right graph pretty much means full points

a. Create a UML use case diagram with at least three use cases of this network monitoring system. (13 points)
b. Use UML sequence diagram to show a data collection sequence. (14 points)
c. Create a UML state machine diagram of the central server. (14 points)