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**University Examinations 2015/2016**

FIRST YEAR, SECOND SEMESTER EXAMINATION FOR MASTER SCIENCE IN COMPUTER SCIENCE

**CCE 5158: SECURE SOFTWARE DESIGN & PROGRAMMING**

**DATE: NOVEMBER, 2015 TIME: HOURS**

**INSTRUCTIONS: Answer question ONE and any other Two**

**QUESTION ONE (30 MARKS)**

1. Initially, bad guys were hacking software systems for fun. However, trends indicate that hacking is nowadays being done for profit.

(i) What do you think has triggered this trend? (5 Marks)

(ii) What goes wrong with security both at high management levels and at low levels in organizations? (4 Marks)

1. How would the following design principles affect the safety of your software?
2. Keep it simple (2 Marks)
3. Identify and question your assumptions (2 Marks)
4. Be reluctant to trust (2 Marks)
5. As functionality of a software system increases, so its security also reduces. Do you agree with this opinion? Discuss (5 Marks)
6. In what ways would static analysis tools be used to improve software security?(5 Marks)
7. Passwords are normally used to control system access. However, passwords are limited in numerous ways. Outline these limitations. (5 Marks)

**QUESTION TWO (15 MARKS)**

1. It has been argued that a good approach is to integrate security into the software development life cycle model (SDLC). What security related activities would you incorporate into the following SDLC phases?
2. Requirements (2 Marks)
3. Design (2 Marks)
4. Coding (2 Marks)
5. Testing (2 Marks)
6. What are security activity graphs and how do they help in preventing software vulnerability? (7 Marks)

**QUESTION THREE (15 MARKS)**

We use log file analyzers for automatic server log analysis.

1. Describe the characteristics of log files. (8 Marks)
2. Explain how a log file analyzer works. (3 Marks)
3. Give any two instances when a log file analyzer will reject a report trace? (4 Marks)

**QUESTION FOUR (15 MARKS)**

1. Describe the threat modeling process that may be done during review stage. (10 Marks)
2. What is black box testing and what are its pros and cons? (5 Marks)

**QUESTION FIVE (15 MARKS)**

1. The following passwords are considered as bad. Modify them to make the good.
2. jonnie-carson (1 Mark)
3. 5211 (1 Mark)
4. StanKamau (1 Mark)
5. Biometrics have in recent years become a hot research topic among computer scientists. Some of the popular biometrics include finger prints and the iris.
6. What do you think makes biometrics so important to us today? (4 Marks)
7. What are the challenges of using finger prints? (4 Marks)
8. What are the challenges of using the iris? (4 Marks)