

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN
COMPUTER SCIENCE**

COSC 332: SOFTWARE ENGINEERING

STREAMS: BSC (COMPUTER SCIENCE)

TIME: 2 HOURS

DAY/DATE: MONDAY 10/12/2018

2.30 P.M. – 4.30 P.M.

CANDIDATE INSTRUCTIONS:

- **Answer question one and any other two questions**

Question one (30 marks)

- (a) Among the essential software product attributes, explain why there is emphasis on *dependability and security* in ecommerce software and banking software systems. (3 marks)
- (b) Other than dependability and security, explain three other essential quality attributes of good software. (3 marks)
- (c) Describe what software prototyping is and two benefits of this software development process. (4 marks)
- (d) In incremental development approach, explain why software development phases are interleaved. (4 marks)
- (e) In principle, requirements should be complete and consistent. Explain why in practice, this is not possible. (4 marks)
- (f) Explain why a project plan must keep on changing as a software project development continues. (4 marks)

- (g) Using an illustration from student web portal software, explain the difference between functional requirement and non-functional requirement. (4 marks)
- (h) Discuss two main reasons of testing software systems. (4 marks)

Question two (20 marks)

- (a) Discuss the five stages of software development as outlined in the software development lifecycle. (10 marks)
- (b) A car manufacturer wishes to save weight and improve reliability by replacing most of the vehicle's wiring harness with a local area network. Systems such as engine management, anti-lock braking, traction control and stability control will thus share common platform components. Your task is to ensure that the safety of these systems, and of the vehicle electronics overall, is not impaired by this upgrade. Describe the methodology you would adopt for the project, and justify your choice. (6 marks)
- (c) The described in part (b) is a software maintenance activity. Identify and explain this type of maintenance. (4 marks)

Question three (20 marks)

- (a) What is *Integration testing*? Explain why is integrating testing harder than unit testing? (5 marks)
- (b) Explain the purpose of each of the following testing stages
- i) Regression testing (3 marks)
 - ii) Release testing (3 marks)
 - iii) User testing (3 marks)
- (c) Discuss the relevance of software inspections as a complement to software testing. (6 marks)

Question four (20 marks)

- (a) In your third year second semester you will be engaged in a group project task to develop a working software application system. You will need a project manager in your group who will be responsible of project scheduling. Discuss the manager's role in project scheduling and the activities he/she will have to perform on behalf of the group. (8 marks)
- (b) In your new industrial attachment placement, as a software developer, you are required to make changes to a Java program used in the organization. Discuss the process you will take to effect changes appropriately. (6 marks)
- (c) Discuss three handover problems associated with maintenance of software. (6 marks)

Question five (20 marks)

- (a) Explain the following software dependability attributes: *safety* and *security*. Which of them is a key determinant for software running a motor vehicle and student web portal software? (6 marks)
 - (b) As a software developer, you are assigned the task of gathering user requirements for the software project you just won. State and explain any three problems you may encounter in developing a requirements document in a natural language such as English. (6 marks)
 - (c) Given any large software project, discuss the challenges faced in scheduling of tasks. (8 marks)
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