

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**FIRST YEAR EXAMINATION FOR THE AWARD OF DEGREE OF
BACHELOR OF SCIENCE AND BACHELOR OF SCIENCE IN APPLIED
COMPUTER SCIENCE**

COMP 306: SOFTWARE ENGINEERING I

STREAMS: Y3S1

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 13/12/2017

11.30 A.M – 1.30 P.M

INSTRUCTIONS:

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

Question One (30 marks)

- (a) Explain why program testing should focus on uncovering defects more than providing proof that the software is working well. [3 marks]
- (b) Before the start of any software project, a feasibility study is commissioned though not explicitly. Explain the importance of this early step. [3 marks]
- (c) Using a good illustration, explain how a developer can get feedback from the user when developing a user interface. [3 marks]
- (d) Discuss three quality attributes of a good software system product. [3 marks]
- (e) Software requirements should be complete and concise. Explain why this is not possible to achieve in practice. [3 marks]
- (f) Discuss why software project planning is an iterative process and why the plan must be reviewed continually during the project development. [3 marks]
- (g) Consider the university's student web portal system. Explain the development methodology or model you would use to come up with such a system if tasked to do so. Justify the choice. [3 marks]

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- (h) Explain the difference between white box testing and black box testing methodologies. [3 marks]
- (i) Describe what software prototyping is and two benefits of this software development process. [3 marks]
- (j) Suppose during your industrial attachment period, you find a contract of developing a point of sale system for a local super market chain. Explain three reasons why you would go for open source development tools. [3 marks]

Question Two (20 marks)

- (a) Discuss two best approaches of delivering a software product to the intended users of the product. [4 marks]
- (b) Chukka university students' management system was developed using a combination of plan-based and agile methodologies. Explain why many software development companies and their prospective client will advocate for this hybrid approach. [8 marks]
- (c) The first phase in software development is requirements definition. In this phase there are several activities involved. For either a small project or large project, explain the importance of this phase and the activities involved. [8 marks]

Question Three (20 marks)

- (a) The IEBC software system for managing elections is considered a success though with challenges. Explain two approaches the IEBC can take to assure stakeholders of the validity of the data stored in the system during user level testing. [4 marks]
- (b) Explain the importance of the following software testing approaches: [6 marks]
 - (i) Unit testing
 - (ii) Integration testing
 - (iii) Regression testing
- (c) Google have spent several years developing self-driving cars which rely on a range of sensors and stored data and are now claimed to have covered hundreds of thousands of miles with a good safety record. A Google executive has now asked to meet the Transport Secretary, who has in turn asked your company for advice. Discuss five safety risks that the government should demand from vendors and service providers if autonomous vehicles are to be allowed on Kenyan roads? [10 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) Discuss the contribution and the relative value of the following aspects of the modern software development environment.
- (i) Dividing a project into short development episodes. [4 marks]
 - (ii) Automated regression testing tools. [4 marks]
 - (iii) Project progress visualization tools such as GANTT charts. [4 marks]

Question Five (20 marks)

- (a) In your recent trip to Mombasa using "Madaraka Express" train, you realized there was need for the train management to provide an online booking system. As a software development expert, develop four user requirements the clients may suggest. From those four user requirements, develop system requirements. [10 marks]
- (b) Risks are part of any software project, for the system in (b) above; discuss the process you would take to manage the risks in the course of development. Begin by identifying four risks that are likely to occur in the said project and use them to show the process of managing them. [10 marks]
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