ALUPE UNIVERSITY COLLEGE

... *Bastion of Knowledge*....

OFFICE OF THE DEPUTY PRINCIPAL
ACADEMICS, STUDENT AFFAIRS AND RESEARCH

UNIVERSITY EXAMINATIONS

2019 /2020 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER REGULAR EXAMINATION

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

COURSE CODE: COM 220

COURSE TITLE: SOFTWARE ENGINEERING I

DATE: 26TH OCTOBER, 2020   TIME: 0900 – 1200 HRS

INSTRUCTION TO CANDIDATES

- **SEE INSIDE**

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COM 220

REGULAR – MAIN EXAM

COM 220: SOFTWARE ENGINEERING I

STREAM: COMPUTER SCIENCE   **DURATION: 3 Hours**

INSTRUCTIONS TO CANDIDATES

i.   *Answer Question ONE and any other TWO questions.*

ii.   *Maps and diagrams should be used whenever they serve to illustrate the answer.*

iii. *Do not write on the question paper.*

SECTION A (24 MARKS) COMPULSORY

QUESTION ONE (12 Marks)

a) According to Fritz Bauer, a German computer scientist, "Software engineering is the establishment and use of sound engineering principles in order to obtain economically software that is reliable and work efficiently on real machines. Based on this definition state two reasons why S.E is considered to be highly important.   (4 Marks)

b) Describe Four activities that may be part of the design process for an information systems
                                                                                     (4 Marks)

c) Identify two factors that lead to software failures that are more often than not wrongly attributed to Software engineering   (4 Marks)

QUESTION TWO (12 Marks)

a) Describe the activities associated with the requirements elicitation and analysis process
                                                                                     (4 Marks)

b) Explain how UML Models of both new and existing system are used during requirements engineering.   (4 Marks)

c) One can design software architectures at two levels of abstraction, architecture in the small and architecture in the large distinguish between the two   (4 Marks)

SECTION B (36 MARKS) ATTEMPT ANY THREE QUESTIONS

QUESTION THREE (12 Marks)

To make legacy software systems easier to maintain, you can reengineer these systems to improve their structure and understandability. Use a well labeled diagram to illustrate the reengineering process of a legacy system   (12 Marks)

QUESTION FOUR (12 Marks)

a) Describe the three (3) stages of testing that a commercial software system has to go through (6 marks)

b) Incremental delivery of a software program is an approach to software development where some of the developed increments are delivered to the customer and deployed for use in an operational environment. List three advantages associated with incremental delivery (3 Mark)

c) Outline the three types of interactions that can be represented in a model (3 Marks)

QUESTION FIVE (12 Marks)

a) Extreme programming (XP) is perhaps the best known and most widely used of the agile methods, the approach was developed by pushing recognized good practice, such as iterative development, to 'extreme' levels. That said however Extreme programming still involves a number of practices which reflect the principles of agile methods, describe five such principles (5 Marks)

b) Discuss three (3) advantages of explicitly designing and documenting software architecture (3 marks)

c) Consider the following Weather station scenario:

Report weather—send weather data to the weather information system
Report status—send status information to the weather information system
Restart—if the weather station is shut down, restart the system
Shutdown—shut down the weather station
Reconfigure—reconfigure the weather station software
Powersave—put the weather station into power-saving mode
Remote control—send control commands to any weather station subsystem
come up with a use case model for the above scenario (4 Marks)

QUESTION SIX (12 Marks)

a) While referring to a well labelled diagram discuss the testing phases in a plan-driven software validation process (8 Marks)

b) Distinguish between functional and non-functional requirements with regards to the design of a system (4 Marks)

QUESTION SEVEN (12 MARKS)

a) With the aid of a well labelled diagram clearly indicating design inputs, design activities and design outputs; state your understanding of the term software design (6 marks)

b) Describe the three (3) fundamental characteristics of rapid software development (6 Marks)

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