THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

A. M. E. C. E. A

MAIN EXAMINATION

MAY – AUGUST 2021

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE

REGULAR PROGRAMME

CMT 311: FUNDAMENTALS OF SOFTWARE ENGINEERING

Date: AUGUST 2021	Duration: 2 Hours
INSTRUCTIONS: Answer Question ONE and any other TWO Questions	

Question 1 (30 Marks)

a) Explain any TWO advantages of sketching a proposed user interface as opposed to using a drawing program or building a prototype. **(4 Marks)**

b) Using relevant illustrations/examples, justify the need and purpose of Software Engineering. **(6 Marks)**

c) Discuss the fundamental software engineering activities. **(4 Marks)**

d) Discuss any THREE key challenges facing software engineering **(6 Marks)**

e) Differentiate between the below terms as used in Software Engineering:

    i.   Software engineering and computer science **(2 Marks)**

    ii.   Maintainability and Usability **(2 Marks)**

    iii.   Generic software and Customized software **(2 Marks)**

    iv.   Software process and Software process model **(2 Marks)**

    v.   Plan-driven processes and agile processes **(2 Marks)**

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Question 2 (20 Marks)

a) Discuss the waterfall model, outlining its main characteristics, advantages and disadvantages. **(6 Marks)**

b) Discuss the Incremental and Reuse-oriented software process models **(6 Marks)**

c) Discuss the Requirements engineering process outlining the FOUR main activities performed in this phase **(8 Marks)**

Question 3 (20 Marks)

a) Discuss the techniques and procedures you would put in place to ensure change is well taken care of in a software development exercise. **(6 Marks)**

b) Outline any THREE reasons why requirements change during the software development process. **(6 Marks)**

c) Discuss any FOUR benefits of prototyping **(8 Marks)**

Question 4 (20 Marks)

a) Explain what is meant by prototyping in Software Engineering. **(2 Marks)**

b) Describe THREE situations when to use prototypes. **(6 Marks)**

c) Using an appropriate diagram, discuss the Boehm's spiral model of software development. **(12 Marks)**

Question 5 (20 Marks)

a) Discuss the Rational Unified Process, outlining its main phases and characteristics. **(4 Marks)**

b) List and explain any THREE principles of agile methods of Software development **(6 Marks)**

c) Contrast between the following terminologies:

   i. Functional and non-functional requirements **(2 Marks)**

   ii. Extreme programming and Rapid Application development **(2 Marks)**

   iii. User requirements and System requirements **(2 Marks)**

   iv. Upper-CASE tools and Lower-CASE tools **(2 Marks)**

   v. Component testing and System testing **(2 Marks)**

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