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University Examinations 2013/2014

SECOND YEAR, FIRST SEMESTER EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

AND

FOURTH YEAR, FIRST SEMESTER EXAMINATION FOR DEGREE OF BACHELOR OF BUSINESS IN INFORMATION TECHNOLOGY

ICS 2302: SOFTWARE ENGINEERING

DATE: APRIL 2014   **TIME: 2 HOURS**

INSTRUCTIONS: *Answer question **one** and any other **two** questions in Section B*

QUESTION ONE – (30 MARKS)

(a) Distinguish between the phrases "software engineering" and "computer science" and explain how they complement each other.   (6 marks)

(b) Describe the main problems that are associated with natural language specifications.   (4 marks)

(c) Describe the strategies for identifying object classes during object oriented design.   (6 marks)

(d) What is software evolution? Do you think software evolution is inevitable?   (4 marks)

(e) What are the program inspections and why are they important when developing large scale industry software?   (4 marks)

(f) Outline the problems associated with software development that resulted to the software crisis in 1960's and then explain how software engineering solves these problems.

(6 marks)

QUESTION TWO – (20 MARKS)

(a) Comparing the state of software that existed in the 1960s and the current state, would you say that the software crisis over? Support your answer with suitable explanations and examples. (6 marks)

(b) Distinguish between software process and software process models. (4 marks)

(c) One of the earliest software models that has been found to have several limitations but that is nevertheless widely used is the waterfall model. Explain the possible ways of overcoming these limitations and then explain what types of projects are most suited for it. (6 marks)

(d) Explain the difference between static and dynamic design models. (4 marks)

QUESTION THREE – (20 MARKS)

a) Describe the difference between domain requirements and system requirements and then explain why it is so challenging to elicit domain requirements. (4 marks)

b) While on a requirements elicitation exercise from a client who wants a website done for their company, you came across this interesting user requirement: We want the homepage of the website to be user-friendly. Identify some of the problems with this user requirement? (6 marks)

c) Distinguish between functional and non functional requirements (4 marks)

d) After analyzing the requirements for the website in (b) above, you find that you have 10 requirements and five non functional requirements. One of these non functional requirements is that member login should be so efficient that the user should not wait more than 2 seconds. Explain how the considerations of this non functional requirement affect the design and implementation of your functional requirements.

(6 marks)

QUESTION FOUR – (20 MARKS)

(a) Describe the human factors to be considered when developing the user interface design.

(4 marks)

(b) Explain the advantages and disadvantages of the following user interaction styles.
  i.   Direct manipulation   (2 marks)
  ii. Form fill-in   (2 marks)
  iii. Natural language   (2 marks)

(c) Explain the instances under which you would choose the following technologies in order to ensure high quality for your upcoming software.
  i.   Automated static analysis   (2 marks)
  ii. Formal methods   (2 marks)

(d) Describe the software inspection process.   (6 marks)

QUESTION FIVE – (20 MARKS)

(a) What in your opinion is importance of software evolution?   (6 marks)

(b) Despite the fact that Lehman's laws of software evolution have been generally accepted, they too have a serious limitation. Explain this limitation.   (4 marks)

(c) It has been said that maintenance costs for software can range anywhere between two times (2*) to one hundred times (100*) the cost of software development. Explain.

(4 marks)

(d) Explain how software size metrics may be used to estimate the schedule of software project.   (6 marks)