

KASNEB

CICT PART III SECTION 5

SOFTWARE ENGINEERING

WEDNESDAY: 24 May 2017.

Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question.

QUESTION ONE

(a) Describe the following software engineering terms:

- (i) Portability. (2 marks)
- (ii) Adaptability. (2 marks)
- (iii) Code refactoring. (2 marks)

(b) Critique the choice of a "pipe and filter" architectural style to develop a back office order fulfilment software. (6 marks)

(c) Highlight four benefits of undertaking information systems audits. (4 marks)

(d) Functional decomposition in software engineering emphasises the identification of sub-functions required to achieve the product function and usually takes the form of a block diagram.

With reference to the above statement, summarise the procedure that you would use to create an effective block diagram. (4 marks)

(Total: 20 marks)

QUESTION TWO

(a) Software engineering is said to be a layered technology of processes, methods, tools and quality checks.

Examine the role of processes, methods and tools layers in this approach. (6 marks)

(b) A software development process should be agile and prescriptive.

(i) Interpret the above statement in the context of software engineering. (2 marks)

(ii) Describe the nature of a prescriptive software development process. (2 marks)

(c) "By critically examining the product of a software development process, we are able to establish a mindset of a solid software engineering practice".

Citing five reasons, argue the case for the above statement. (5 marks)

(d) Software process assessment and improvement are critical activities during and after the construction of a software product.

Required:

(i) Explain the need for the above activities. (2 marks)

(ii) Outline three software assessment and improvement tools. (3 marks)

(Total: 20 marks)

QUESTION THREE

(a) Formulate four questions that would facilitate the development of a business case. (4 marks)

(b) Effort costs are not only the salaries of the software engineers who are involved in the project but also include other overhead costs.

Suggest five overhead costs that form part of the total software development cost for an organisation. (5 marks)

(c) Mr. Alfred Mbii, a young professional in information technology (IT) is in the process of developing an application with a team of colleagues. He finds himself continuously adding people to the project in the hope of shortening the development time.

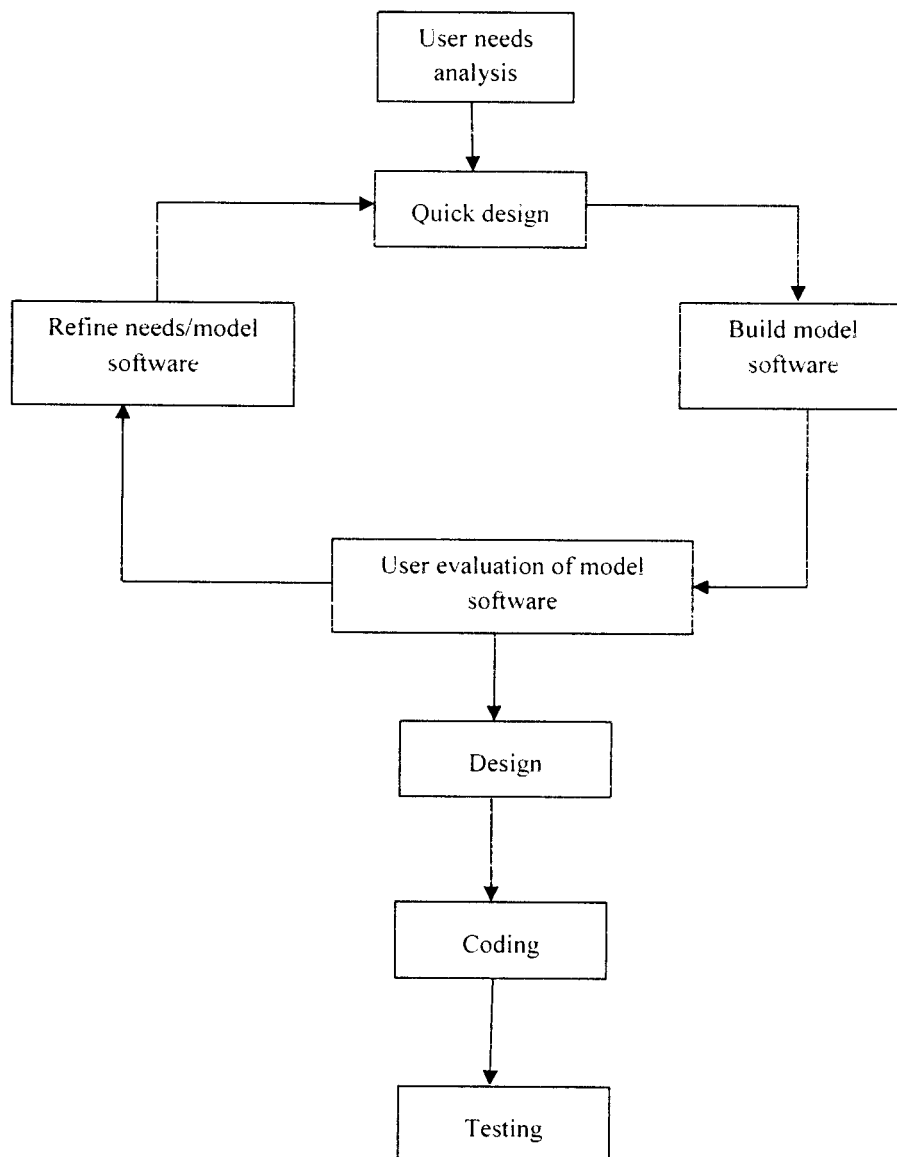
With reference to the constructive cost model (COCOMO) of software estimation, advise Mr. Alfred Mbii on any other four options of shortening the time schedule of an information system's project. (4 marks)

(d) Paul Njei, a project supervisor, is taking his team through the software requirements analysis phase. Citing seven reasons, evaluate the importance of the software requirements analysis phase in software development. (7 marks)

(Total: 20 marks)

QUESTION FOUR

- (a) (i) Analyse three targets that a software engineer would focus on when carrying out software testing. (3 marks)
 - (ii) Differentiate between “black box software testing” and “white box software testing”. (4 marks)
 - (iii) In each case, identify three functions of software testing methods in (a)(ii) above. (6 marks)
- (b) The diagram below represents a software development model:



Required:

- (i) Identify the software engineering model displayed on the diagram above. (1 mark)
 - (ii) Outline two advantages and two disadvantages of the model identified in (b)(i) above. (4 marks)
 - (iii) Suggest two instances when it would be most applicable to use the software development model identified in (b)(i) above. (2 marks)
- (Total: 20 marks)**

QUESTION FIVE

- (a) Appraise four types of software maintenance that might be undertaken during the life of a software. (8 marks)
 - (b) (i) Differentiate between “location based” and “staged” software conversion strategies. (4 marks)
 - (ii) Analyse two strengths and two weaknesses of each of the software conversion strategies in (b)(i) above. (8 marks)
- (Total: 20 marks)**
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