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CICT PART III SECTION 5

SOFTWARE ENGINEERING

WEDNESDAY: 1 September 2021. Time Allowed: 3 hours.

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

QUESTION ONE
(a) Explain four parameters that could assist in determining the accuracy of a software project cost estimation. (4 marks)

(b) A client has contracted you for a complex software intensive system that requires a lot of input, commitment and guidance from multi-stakeholders and diverse software development teams with various skills. A software development model that could take care of the risks that are involved in such a software development is required.

Required:
(i) Citing two distinguishing features, discuss the most appropriate model which could be used. (6 marks)

(ii) Explain three steps required in the development of the model in (b) (i) above. (3 marks)

(c) Software Configuration Management (SCM) is a major task in software engineering.

Required:
With reference to the above statement:

(i) Explain the meaning of SCM. (3 marks)

(ii) Assess any four benefits of SCM. (4 marks)
(Total: 20 marks)

QUESTION TWO
(a) Explain the functions of an integrated CASE tool repository. (4 marks)

(b) (i) Elaborate the principle behind concurrency. (2 marks)

(ii) Explain how the principle in (b) (i) above could be achieved during the software product delivery. (2 marks)

(c) Distinguish between each of the following pair of terms as used in software engineering:

(i) "Technical software quality" and "business software quality". (2 marks)

(ii) "Partitioning" and "abstraction". (2 marks)

(iii) "Throw-away prototyping" and "evolutionary prototyping". (2 marks)

(d) Discuss the three cost factors that contribute to the cost of quality in software development. (6 marks)
(Total: 20 marks)

QUESTION THREE
(a) (i) Contrast an avoidance and a minimisation strategy in project risk management. (4 marks)

(ii) Assess five ways in which visibility could be enhanced in software testing. (5 marks)

(b)   Commercial pressure for an early product release could affect product quality.

Required:
Examine the characteristics of the final product that could be affected if less attention is paid to the following quality attributes:

(i)   Modularity.   (2 marks)

(ii)   Usability.   (2 marks)

(iii)   Efficiency.   (2 marks)

(c)   Assess five attributes of software structural quality testing.   (5 marks)
                                                                                                       (Total: 20 marks)

QUESTION FOUR
(a)   A business enterprise considers that the processing requirements of an appropriate software are specific to their own organisation. The business therefore requires the appropriate software specifically developed for its use.

Required:
(i)   Describe two methods by which the business enterprise could achieve this goal.   (4 marks)

(ii)   Cite one advantage and one disadvantage of custom developed software.   (2 marks)

(b)   One of the methods of estimating the cost of software development is determining the effort required through various metrics.

Required:
Describe five types of function point metrics.   (5 marks)

(c)   Enumerate the five steps of the component-based development model that could be implemented using an evolutionary approach.   (5 marks)

(d)   Citing four reasons, explain why a legacy system should be reengineered after a given period.   (4 marks)
                                                                                                       (Total: 20 marks)

QUESTION FIVE
(a)   Using a commercial off-the-shelf (COTS) package is an example of software application system reuse.

        Examine three benefits and three disadvantages of using a COTS package.   (6 marks)

(b)   (i)   Draw a context Data Flow Diagram (DFD) for a food ordering system.

                Ensure that it includes the participants; supplier, kitchen, manager and customer as entities interacting with the system.   (3 marks)

        (ii)   Generate a possible level I DFD from the context diagram in (b) (i) above.   (8 marks)

(c)   Discuss why it might be impractical for a financial institution to use parallel conversion to change from the current software to a more robust software that could enable its customers to access modern banking options including mobile banking.   (3 marks)
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