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CICT PART III SECTION 5

SOFTWARE ENGINEERING

WEDNESDAY: 19 May 2021. **Time Allowed: 3 hours.**

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

QUESTION ONE

(a) Outline two benefits of using a phased approach as a conversion strategy in Software Engineering. (2 marks)

(b) Describe the following terms as used in Software Engineering:

(i) Modularity. (2 marks)

(ii) Information hiding. (2 marks)

(iii) Functional independence. (2 marks)

(c) Evaluate two techniques of system checking and analysis that are used to satisfy the objectives of verification and validation. (4 marks)

(d) As the head of ICT in a leading company, you are required to install a biometric software.

Evaluate four key points that will lead you to decide on whether to develop or purchase the software. (8 marks)

(Total: 20 marks)

QUESTION TWO

(a) The cost of software maintenance is approximately fifty percent of all software development phases.

Suggest three real-world factors affecting the cost of software maintenance. (3 marks)

(b) A customer places an order with the sales department of a company. A clerk verifies the order, stores the order in a customer order file, and sends an acknowledgement to the customer.

Required:
Draw a Data Flow Diagram (DFD) depicting this action. (7 marks)

(c) Differentiate between direct and indirect software measurement techniques. (4 marks)

(d) Assess the areas that are taken into consideration during unit testing. (6 marks)

(Total: 20 marks)

QUESTION THREE

(a) Explain the term software prototype. (2 marks)

(b) Describe four concepts that are employed in the functional programming method. (8 marks)

(c) An aircraft manufacturing company intends to improve its next generation of aircrafts by automating most of its functionalities. From the discussions with your Software Engineering Team, the company has very detailed and well understood requirements that are unlikely to change during the Software Development process.

Required:
Discuss the best suited process model that could be used to develop the software. (10 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Identify two roles that a customer plays in software validation and verification. (2 marks)

(b) Contrast the following terms as used in Software Engineering:

(i) "Software" and "Software Engineering". (2 marks)

(ii) "Generic products" and "customised products". (2 marks)

(c) Examine three different types of software maintenance that need to be undertaken during the life of a software. (6 marks)

(d) Software cost estimation involves various techniques.

Required:
With reference to the above statement, differentiate between the following terms:

(i) "Algorithmic cost modelling" and "Expert judgement". (4 marks)

(ii) "Estimation by analogy" and "Pricing to win". (4 marks)
(Total: 20 marks)

QUESTION FIVE

(a) You are tasked to come up with coding standard procedure manuals.

Propose four important items that should be part of the manual. (4 marks)

(b) You have been invited to make a presentation on the cost of quality to a Software Engineering class at one of the universities in the country.

Evaluate the various categories that contribute to the cost of quality during the development and use of the software. (7 marks)

(c) Examine three audit techniques that could be applied to audit information systems. (6 marks)

(d) Examine three uses of the balanced score card in budgeting for Information Systems. (3 marks)
(Total: 20 marks)

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