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CICT PART III SECTION 5

SOFTWARE ENGINEERING

WEDNESDAY: 23 May 2018.   **Time Allowed: 3 hours.**

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

QUESTION ONE
(a)   Highlight four factors that influence software quality.   (4 marks)

(b)   The management of ABC Company Ltd. intends to acquire an enterprise resource planning (ERP) software system in order to address various operational challenges. You have been contracted by the management of ABC Company Ltd. to lead a team of officers responsible for carrying out a feasibility study.

Required:
(i)   Propose four dimensions that you would consider during the feasibility study.   (8 marks)

(ii)   Your team has also been assigned the task of preparing user specifications for the ERP system.

In relation to the user interface design, analyse four key requirements that you would recommend for the proposed ERP system.   (8 marks)
(Total: 20 marks)

QUESTION TWO
(a)   Describe three parameters for computing the total cost of a software development project.   (3 marks)

(b)   Outline two advantages of each of the following software conversion strategies:

(i)   Abrupt cutover.   (2 marks)

(ii)   Parallel conversion.   (2 marks)

(iii)   Location conversion.   (2 marks)

(iv)   Staged conversion.   (2 marks)

(c)   Shopping software for an e-commerce site requires features that help you sell and succeed online under stiff competition. The software also includes a shopping cart feature that enables you to boost customer confidence and encourage repeat sales. The main features of such an online shopping cart include:

- User account.
- Payment method.
- Line items.
- Order method.
- Products.

Required:
By treating each of the above features as classes, draw a well labelled class diagram that shows how the classes are related. For each of the classes, include at least two properties.   (9 marks)
(Total: 20 marks)

QUESTION THREE

(a)   Architectural design is one of the most important subsequent activities after requirements engineering.

With reference to the above statement:

(i)   Explain the meaning of the term "software architecture".   (2 marks)

(ii)   Highlight three advantages of an explicit software architecture.   (3 marks)

(iii)   Assess the "4 + 1 view model" of software architecture.   (5 marks)

(b)   Agile software development methods are usually preferred to plan-driven approaches.

Summarise the key features of agile software development methodologies.   (4 marks)

(c)   Web services have greatly changed the overall paradigm of software engineering.

Required:

(i)   With the aid of a diagram, illustrate the service-oriented architecture.   (3 marks)

(ii)   Outline three benefits of a service oriented architecture.   (3 marks)

(Total: 20 marks)

QUESTION FOUR

(a)   Illustrate how an information systems auditor would use each of the following auditing techniques:

(i)   Inspection.   (2 marks)

(ii)   Observation.   (2 marks)

(iii)   Inquiry and confirmation.   (2 marks)

(b)   Software metrics aid in determining the quality of a software product by improving and helping predict the process of a software development project.

With reference to the above statement, examine six attributes of an effective software metric. (6 marks)

(c)   Tumbo Clinic is a chain of restaurants that specialises in traditional food. The clinic has several outlets spread across the city. To manage the outlets, the management of the clinic require you to provide a proof of concept as an assurance of your capability to provide the required solution. As an experienced systems developer, you have come up with a quick solution which you have presented to the management of Tumbo Clinic. The management are in a hurry to roll-out the system. Consequently they have requested that you implement the presented solution immediately.

Required:
Citing four reasons, justify to the management of Tumbo Clinic why it would be unwise to roll-out the system at this stage.   (8 marks)

(Total: 20 marks)

QUESTION FIVE

(a)   In relation to software engineering, describe each of the following types of software testing:

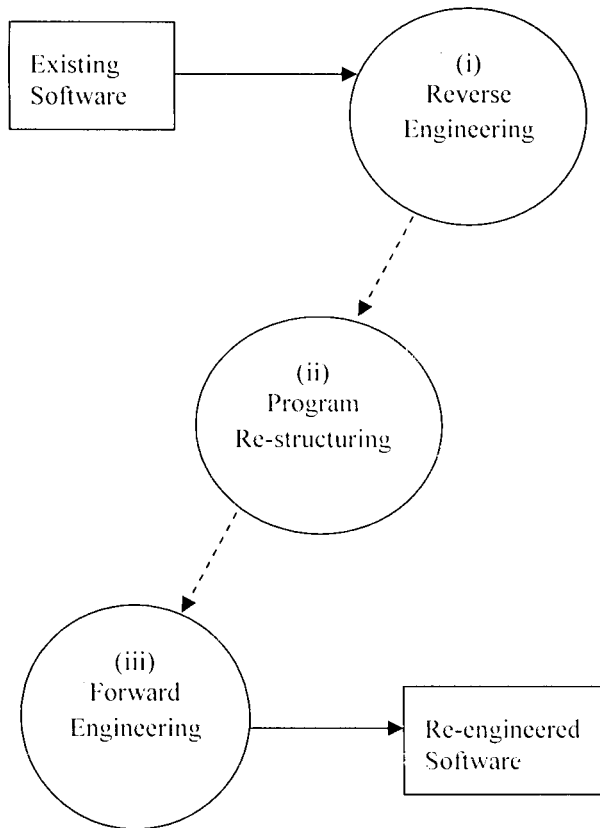(i)   Development testing.   (2 marks)

(ii)   System testing.   (2 marks)

(iii)   Acceptance testing.   (2 marks)

(b)   Requirements analysis is critical to the success or failure of a software systems project.

Argue the case for the above statement.   (8 marks)

(c)   The diagram below depicts the typical process of software re-engineering:

Required:

Explain the concepts in steps (i), (ii) and (iii) above.   (6 marks)
(Total: 20 marks)

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