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CICT PART III SECTION 5

SOFTWARE ENGINEERING

TUESDAY: 26 November 2019.

Time Allowed: 3 hours.

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

QUESTION ONE

- (a) Activity Based Costing (ABC) is a costing methodology where costs are allocated to products and services based on the number of transactions or events involved in the process of providing a product or a service.

With reference to the above statement, outline three conditions necessary for the applicability of ABC method in software development. (3 marks)

- (b) An aircraft manufacturing company intends to improve its flight operation software with an aim of easing the pilots' effort in controlling the aircraft. You have been called upon to constitute a software engineering team to test the software before launching the flight.

Required:

- (i) Justifying your answer, suggest the appropriate technique you would need to use in order to ensure that the software is reliable. (5 marks)
- (ii) State two reasons why many software developers shun the technique suggested in (b) (i) above in preference to alternative techniques. (2 marks)
- (c) A software developer has completed several components that are being put together to achieve the intended functionality of a complex system.

Required:

Discuss two types of testing that should be undertaken prior to the roll out of the system. (4 marks)

- (d) Appraise three challenges that could be encountered during the requirement elicitation of a software project. (6 marks)
- (Total: 20 marks)**

QUESTION TWO

- (a) Summarise four advantages of implementing a coding standard in an organisation. (4 marks)

- (b) You have been assigned to carry out a quality assessment of a software package that has been delivered to a customer.

Required:

- (i) Analyse the quality metrics that you would factor in order to determine the product quality. (6 marks)
- (ii) Assess three broad areas that could be used to determine the cost of quality. (4 marks)
- (c) A commercial bank intends to attract and retain customers with competitive interest rates for its fixed deposit customers. The customers with a balance of less than one million get an interest rate of 5% per annum, those with between one and ten million shillings get 7% per annum and those with above ten million shillings get 9% per annum.

Required:

Represent the above information in a decision table. (6 marks)

(Total: 20 marks)

QUESTION THREE

- (a) (i) Evaluate three drawbacks of rapid application development (RAD) software process model. (6 marks)
 - (ii) For physical objects, maintenance is required to repair the effects of wear and tear.
Describe an instance that would trigger maintenance of non-buggy software. (2 marks)
 - (b) Outlining the contents of each document, differentiate between the “software requirement specification (SRS) document” and the “software design document”. (8 marks)
 - (c) Embedded audit is one of the recognised computer-assisted audit techniques that could be used in a continuous auditing environment.
Describe the working of an embedded audit. (4 marks)
- (Total: 20 marks)**

QUESTION FOUR

- (a) Software development could be summarised into four generic process activities.
Analyse three of the above process activities. (6 marks)
 - (b) Explain the meaning of the term “heterogeneity challenges” as applied to software engineering. (2 marks)
 - (c) Distinguish between a “milestone” and a “customer deliverable” in the context of a software development project. (4 marks)
 - (d) Consider the following natural language-based program description:

Perform integer subtraction using the primitive “subtract 1” and a While loop. Let M be the minuend, S the subtrahend and D the difference. The original values of S and M should be retained. Assume that the subtrahend is non-negative.

Required:

 - (i) A model-based requirement specification (4 marks)
 - (ii) An operational requirement specification for the given case. (4 marks)
- (Total: 20 marks)**

QUESTION FIVE

- (a) You have been tasked to produce a software “mockup”.
Defend your choice for either horizontal or vertical prototyping that you would employ. (4 marks)
 - (b) Distinguish between “CASE workbenches” and “CASE environments”. (2 marks)
 - (c) Explain why interactive systems are usually difficult to represent using the pipe lining (data-flow) model. (6 marks)
 - (d) (i) Justifying your answer, explain the need for data conversion. (4 marks)
 - (ii) Outline four tasks in a software configuration management (SCM) process. (4 marks)
- (Total: 20 marks)**
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