

KASNEB

CICT PART III SECTION 5

SOFTWARE ENGINEERING

WEDNESDAY: 25 November 2015.

Time Allowed: 3 hours.

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

QUESTION ONE

- (a) Citing its importance, explain the term "software framework". (2 marks)
- (b) Analyse four categories of software process documentation. (4 marks)
- (c) J. P. Johnson Company is in the process of implementing an Enterprise Resource Planning (ERP) system. As the chief software engineer in the company, you are expected to guide other Information Technology (IT) experts through software testing process.

Required:

Citing five relevant examples, prepare a brief presentation to guide the IT experts on how to conduct stress testing of the ERP system. (5 marks)

- (d) A financial institution assesses its customers before considering whether to give them a loan or not. A customer qualifies for a loan if he/she has banked with the institution for more than five years or if he/she produces a bank statement from another bank. In addition, a creditworthiness certificate from a Credit Reference Bureau recognised by a Central Bank is required in both cases.

Required:

Draw the decision table depicting the above scenario. (5 marks)

- (e) Joyce National Hospital (JNH), with five intensive care unit (ICU) wards, intends to change the main software system that is currently being used in the (ICU). The management have sought your advice on the best approach in achieving a smooth transition.

Required:

Critique the different conversion strategies and support one that you would use in this scenario. (4 marks)

(Total: 20 marks)

QUESTION TWO

- (a) Explain four responsibilities of a software engineer in a mobile applications development company. (4 marks)
- (b) Discuss two common types of metrics used in software costing giving a disadvantage of each. (6 marks)
- (c) Assess the importance of software architecture in development of a computer based system. (4 marks)
- (d) You have been tasked to lead a team of developers assigned to come up with an aircraft navigational system to be installed in an aeroplane.

The management have requested for a presentation to enable them understand various software models that are available.

Required:

Appraise three software process models that might be used when developing the information system. (6 marks)

(Total: 20 marks)

QUESTION THREE

- (a) Explain four characteristics of an error message or warning produced by an interactive information system. (4 marks)
- (b) Using an example in each case, differentiate between “quality control” and “quality assurance” in the context of software development. (4 marks)
- (c) CASE tools are considered an essential part of many modern development environments. The best CASE tools enforce common methods and standards. This may discourage their use in an organisation where there is no disciplined environment.

Required:

Assess how CASE tools improve quality and productivity of a software. (4 marks)

- (d) Survivable system analysis is a four-stage process that analyses the current or proposed system requirements and architecture, identifies critical services, attack simulation scenarios and “soft spots” and proposes changes to improve the survivability of a system.

Required:

Explain the key activities in each of the four stages of survivable system analysis. (8 marks)

(Total: 20 marks)

QUESTION FOUR

- (a) Summarise six procedures that might be audited in an information system. (6 marks)
- (b) A company intends to automate its business processes. They have hired you as a consultant to look at their requirements and document them in readiness for a software developer to code and implement.

Discuss three stages that could be carried out when gathering and documenting requirements, indicating the output of each stage. (6 marks)

- (c) You have been contracted by ABC Inc. as an Information Technology (IT) expert in software quality assurance to measure the reliability and availability of a newly installed software.

Required:

Discuss the software reliability and availability metrics that you would use during the exercise. (4 marks)

- (d) Summarise four programming errors that could be checked during code inspection. (4 marks)

(Total: 20 marks)

QUESTION FIVE

- (a) Using suitable examples, discuss the following terms as used in software engineering:

- (i) Coding standards. (4 marks)

- (ii) Coding guidelines. (4 marks)

- (b) Assess the impact of globalisation on software engineering. (4 marks)

- (c) Discuss the attributes of a maintainable software. (4 marks)

- (d) Analyse the considerations that a software engineer should put in place when carrying out reverse engineering of a user interface (UI). (4 marks)

(Total: 20 marks)

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