KASNEB

CICT PART III SECTION 5

SOFTWARE ENGINEERING

WEDNESDAY: 23 November 2016.

Time Allowed: 3 hours.

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

QUESTION ONE
(a)   Describe four software quality factors.   (4 marks)

(b)   In software development, the crucial aspect of user interface design focuses on three areas of concern.

   Required:
   (i)   Identify the three areas of concern.   (3 marks)

   (ii)   Propose the steps that you would follow to create an effective user interface design.   (4 marks)

(c)   The "software crisis" was a term used in the early days of software engineering before it became a well-established subject.

   Required:
   (i)   Analyse six problems that characterised the software crisis of the 1970s and before.   (6 marks)

   (ii)   Highlight three measures that were proposed to address some or all of the problems in (c) (i) above.

(3 marks)
(Total: 20 marks)

QUESTION TWO
(a)   Distinguish between each of the following pairs of software testing techniques:
   (i)   "Alpha" and "beta".   (4 marks)

   (ii)   "Hallway" and "remote usability".   (4 marks)

(b)   As a software engineer, you have been contracted by a company that uses the waterfall model approach to build their software products. However, the company plans to shift to incremental development approach of building its software products.

   Required:
   (i)   Discuss four advantages of incremental development approach over the waterfall model.   (8 marks)

   (ii)   Assess two challenges of incremental approach to building software.

(4 marks)
(Total: 20 marks)

QUESTION THREE
(a)   Ujuzi Software Systems Ltd. intends to engage you as a developer with the specific task of coming up with the documentation of the software lifecycle.

   (i)   Suggest six principles that could guide you in coming up with a sound documentation.   (6 marks)

   (ii)   Examine five types of software documentation that you are likely to prepare.   (10 marks)

(b)   You have been requested to guide your software development team on conducting a formal technical review of a certain software.

   Formulate four objectives that would guide the above exercise.   (4 marks)
(Total: 20 marks)

QUESTION FOUR

(a)   Stating their relationship, distinguish between reverse engineering and re-engineering software systems.   (4 marks)

(b)   "Lines of code metrics (LOC) is the oldest and most widely used size metric in software engineering".

         With respect to the above statement, explain four types of LOC computations.   (8 marks)

(c)   Software requirements include both functional and non-functional requirements.

         (i)   Describe the meaning of the term "non-functional requirements" of a software system.   (2 marks)

         (ii)   Suggest six types of non-functional requirements for a proposed goods inventory system.   (6 marks)
         (Total: 20 marks)

QUESTION FIVE

(a)   Citing an example in each case, explain the following types of information systems' audits:

         (i)   Compliance audits.   (2 marks)

         (ii)   Control self-assessment.   (2 marks)

         (iii)   Integrated audits.   (2 marks)

(b)   Several companies are adopting the commercial-off-the-shelf software (COTS) over the customised ones.

         Outline three advantages and three disadvantages of deploying COTS in a business organisation.   (6 marks)

(c)   In a customer order processing system, a customer places an order for a product with a wholesaler. If the product is available with the wholesaler, then an order line is created whereas if it is not available, then it is back ordered. When all items are processed, an order confirmation is printed and the customer order record is updated.

         Required:
         Create an entity relationship diagram (ERD) for the above customer order processing scenario.   (8 marks)
         (Total: 20 marks)

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