# KASNEB

## CICT PART III SECTION 5

## SOFTWARE ENGINEERING

## PILOT PAPER

September 2015.                                                         Time Allowed: 3 hours.

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

### QUESTION ONE

(a)   Outline four software cost estimation techniques.                          (4 marks)

(b)   Verification and validation are processes that are applied at each stage in software process.

    **Required:**

    (i)   Highlight two main objectives of verification and validation.          (4 marks)

    (ii)  Software testing and software inspections are techniques for verification.

        Distinguish between the two.                                      (4 marks)

(c)   Explain two advantages of staged/phased software conversion strategy.       (2 marks)

(d)   The company you work for develops internet applications. The company is considering using beta testing rather than integration testing.

    **Required:**
    Identify three advantages and three disadvantages of this approach.          (6 marks)
    **(Total: 20 marks)**

### QUESTION TWO

(a)   (i)   Explain two reasons why software evolution is inevitable.          (2 marks)

    (ii)  Software maintenance refers to modifying a program after it has been put into use.

    **Required:**
    Explain any three types of software maintenance activities.              (6 marks)

(b)   List four software process activities.                                    (4 marks)

(c)   Requirements gathering is an important activity in the development of any software product.

    **Required:**
    (i)   Differentiate between user requirement and system requirement.          (2 marks)

    (ii)  Explain three possible problems that can be realised from user requirements.   (6 marks)
    **(Total: 20 marks)**

### QUESTION THREE

(a)   Integration testing can be tackled top-down or bottom up.

    Describe each of these strategies.                                    (4 marks)

(b)   Explain the purpose of each of the following software testing methods:

    (i)   Endurance testing.                                              (2 marks)

    (ii)  Recovery testing.                                                (2 marks)

(c) Define the term "software refactoring". (2 marks)

(d) ABC Ltd. has traditionally kept its development team. It now wants to move to a mission orientation where a single team will be responsible for development and maintenance of each software product.

**Required:**
Indicate two advantages of this re-organisation. (4 marks)

(e) Explain three benefits of using object oriented methods in development of software systems. (6 marks)
**(Total: 20 marks)**

## QUESTION FOUR

(a) Software quality measurement generally starts with high level quality goal, and then identifies metrics that can be used to indicate satisfaction of the quality goals.

**Required:**
For each of the following quality goals, explain why the quality goal is important and identify a metric that can be used to measure it:

    (i)     Reliability. (2 marks)

    (ii)    Maintainability. (2 marks)

    (iii)   Usability. (2 marks)

(b) A company has decided to purchase 'commercial off the shelf (COTS)' software to handle the financial aspects of its business.

**Required:**
    (i)     Outline five criteria that can be used to decide which COTS software applications are suitable for the company. (5 marks)

    (ii)    If no COTs software can be found that matches the required criteria, suggest other three options the company can use to obtain suitable software. (6 marks)

(c) Highlight three software cost elements. (3 marks)
**(Total: 20 marks)**

## QUESTION FIVE

(a) Explain three challenges faced by software engineering practitioners today. (3 marks)

(b) Highlight three benefits of incremental model. (3 marks)

(c) Distinguish between coupling and cohesion as used in software design. (4 marks)

(d) Identify four general requirements of a software documentation. (4 marks)

(e)   (i)     Describe three software quality management activities. (3 marks)

    (ii)    Highlight any three software configuration management activities. (3 marks)
**(Total: 20 marks)**

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