University of Colombo, Sri Lanka

University of Colombo School of Computing

Bachelor of Science in Information Systems

Academic Year 2014/2015 — Second Year Examination — Semester 1— 2015

IS2001 — Software Engineering

(Two (2) Hours)

Answer 3 Questions including Question 1

Number of Pages = 16 Number of Questions = 4

To be completed by the candidate

Index Number | | | | | | | | |

Important Instructions to candidates:

- The medium of instruction and questions is **English**.
- Note that questions appear on both sides of the paper. If a page is not printed, please inform the supervisor immediately.
- Write your index number on each and every page of the question paper.
- The duration of the paper is **Two (2)** Hours.
- This paper has **4** questions on **16** pages.
- Answer **question 1** and **any 2** of the remaining 3 questions.
- Question **1** carries exactly **40 marks** and each of other **3** questions carries exactly **30 marks**.
- **Write your answers on the space provided** on this question paper.
- Any electronic device capable of storing and retrieving text including electronic dictionaries and mobile phones are **not allowed**.
- Non-programmable Calculators may be used.

To be completed by the examiners

1	
2	
3	
4	
Total	

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1. Consider the following description and answer the questions that follow.

An organization provides a number of activity rooms for members to use. To make a room reservation, the member needs to record their booking in a log book. This requires a large amount manual work to maintain the records, which tends to be an error prone approach. Hence, an automated approach is preferred, and the organization would like to have a room booking portal to improve the situation.

Members should be able to login to the room booking portal from anywhere using their member IDs. Then members should be able to first check the availability of their preferred activity rooms, and then make the corresponding bookings online. The staff of the organization should be able to check the booking status of the rooms and have appropriate arrangements for the bookings. In addition, members should also be able to view their booking histories via the interface.

(a). What type of software is proposed for this organization? Justify your answer.

[2 marks]

(b). What are the 2 most important quality attributes the proposed system should demonstrate? Justify your answer.

[4 marks]

(c). Name and explain the most suitable process model to evolve the system with user feedback starting from the initial framework?

[4 marks]

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(d). List down four (4) techniques which can be used to capture requirements from the users.

[4 marks]

(e). Name two (2) types of testings that could take place by the developers before launching the system.

[4 marks]

(f). What is the most suitable software architecture to construct this system? Justify your answer.

[5 marks]

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(g). Briefly explain four (4) functional requirements and four (4) non-functional requirement of this system.

[10 marks]

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(h). Name two (2) main sub-systems in this system and briefly describe them.

[4 marks]

(i). Name a most suitable language to develop the business logic of this system? Justify your answer.

[3 marks]

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2. (a). Briefly describe three (3) problems associated with Software Development.

[6 marks]

(b). Describe the Software Development Life Cycle (SDLC). List down generic stages of SDLC.

[6 marks]

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(c). Describe four (4) situations where Agile Software Development is more suitable than the waterfall model.

[8 marks]

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(d). What is the Repository Model in Software Design? List two (2) advantages of the Repository Model.

[5 marks]

(e). What problems arise if two modules have high coupling?

[5 marks]

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3. (a). Briefly explain following terms with reference to Object Orientation.

i. Abstraction

[2 marks]

ii. Inheritance

[2 marks]

iii. Encapsulation

[2 marks]

iv. Modularity

[2 marks]

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(b). Why software testing is important? Give four (4) reasons.

[4 marks]

(c). Explain the difference between alpha testing and beta testing.

[4 marks]

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(d). What is the difference between *Error* in software and a *Defect* in software.

[4 marks]

(e). define "Code Walkthrough". List down three (3) objectives of code walkthrough.

[5 marks]

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(f). Briefly define software **Evolution**, **Servicing** and **Phase-out**.

[5 marks]

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4. (a). Briefly explain three (3) maintenance cost factors.

[6 marks]

(b). Briefly decribe three (3) risk categories.

[3 marks]

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(c). Discuss two (2) factors that influence a software development team working as a group.

[5 marks]

(d). Define Product Standards and Process Standards.

[2 marks]

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(e). Briefly explain following software quality attributes.

i. Availability

[2 marks]

ii. Traceability

[2 marks]

iii. Resilience

[2 marks]

iv. Portability

[2 marks]

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(f). Briefly explain the three (3) software quality activities.

[6 marks]

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