

THE HONG KONG POLYTECHNIC UNIVERSITY  
HONG KONG COMMUNITY COLLEGE

<b>Subject Title</b> : Software Engineering  <b>Session</b> : Semester Two, 2013/14  <b>Date</b> : 22 May 2014  <b>Subject Examiner(s)</b> : Dr Pat CHAN	<b>Subject Code</b> : CCN3143  <b>Time</b> : 14:00 - 17:00  <b>Time Allowed</b> : 3 Hours
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This question paper has a total of **THIRTEEN** pages (including this covering page).

**Instructions to Candidates:**

1. There are THREE sections in this paper.  
 Section A (40%) – Multiple-choice Questions. Answer ALL questions in this section on the multiple-choice answer sheet provided. Each question carries 1 mark.  
 Section B (30%) – Short Questions. Answer any THREE of the FOUR questions in this section in the answer book provided. Each question carries 10 marks.  
 Section C (30%) – Compulsory Long Questions. Answer ALL questions in this section in the answer book provided. Each question carries 15 marks.
2. Candidates are NOT allowed to retain the multiple-choice answer sheet, the answer book and the examination question paper.
3. Show all your work clearly and neatly. Marks will be deducted for untidy work.

**Authorised Materials:**

	YES	NO
CALCULATOR	[ ]	[✓]
SPECIFICALLY PERMITTED ITEMS	[ ]	[✓]

**DO NOT TURN OVER THE PAGE UNTIL YOU ARE TOLD TO DO SO**



**Section B (30%) – Short Questions**

**Answer any THREE of the FOUR questions in this section in the answer book provided. Each question carries 10 marks.**

Question B1

- (a) Briefly describe the **THREE** main types of software maintenance. (6 marks)
- (b) Identify and discuss the essential conditions for software re-engineering to be successful. (4 marks)

Question B2

- (a) Describe the characteristics of the waterfall software process model. (4 marks)
- (b) Propose a suitable generic software process model for the development of the following software systems. Justify your answer.
  - (I) A voice recognition system (3 marks)
  - (II) A new version of the receipt printing system for a company (3 marks)

Question B3

- (a) Discuss the differences between verification and validation. (4 marks)
- (b) Discuss the differences between white-box testing and black-box testing. (4 marks)
- (c) Give an example for white-box testing. (2 marks)

Question B4

- (a) What kind of system information is shown by class diagrams? (2 marks)
- (b) Draw a class hierarchy diagram of an object model that identifies all the commonalities and extensions between Person and Professor, Student and Clerk. They all have name, email address, and postal address. They all can return their name and email address. In addition, a Professor contains title and salary, and they can give lesson, a student contains major and year and they can have lesson and enrol course, a clerk contains salary, position, and job assignment. (8 marks)

- End of Section B -

**Section C (30%) – Compulsory Long Questions**

Answer **ALL** questions in this section in the answer book provided. Each question carries **15** marks.

Question C1

A small company has developed a specialized product which is configured specially for each customer. New customers usually have specific requirements to be incorporated into their system, and they pay for these to be developed. The company has an opportunity to bid for a new contract, which would more than double its customer base. The new customer also wishes to have some involvement in the configuration of the system.

- (a) What are the **FIVE** essential tools in a software development platform? (5 marks)
- (b) Briefly describe the idea of open-source development. (2 marks)
- (c) Explain why, in these circumstances, it might be a good idea for the company owning the software to make it open source. (8 marks)

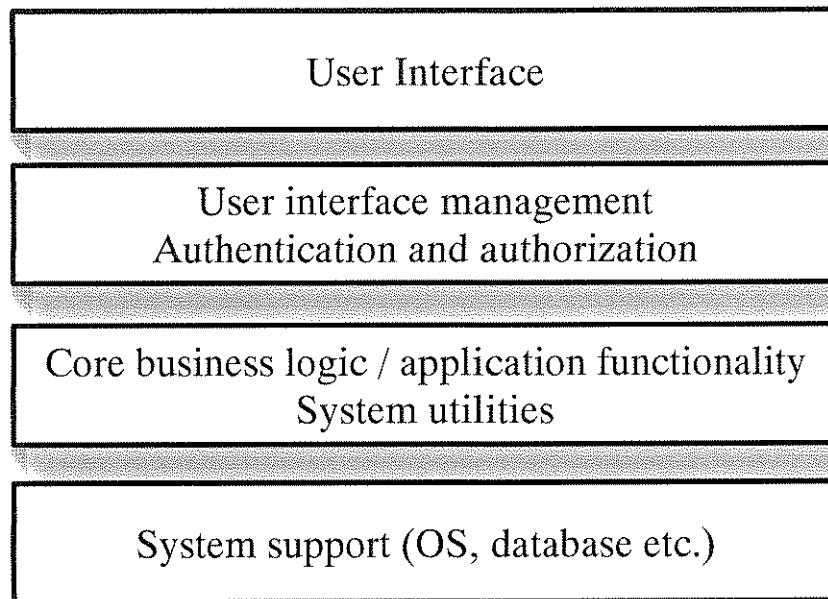
Question C2

Figure 1

- (a) What is the use of an architectural model of a system? State **TWO** ways. (4 marks)
- (b) What kind of architecture pattern Figure 1 belongs to? (1 marks)
- (c) What are the advantages of this architecture pattern? (4 marks)
- (d) When is suitable for using this architecture pattern? (2 marks)
- (e) Using the architectural model shown in Figure 1, suggest the components that might be part of the system that allows users to view information about flights arriving and departing from a particular airport. (4 marks)

- End of Section C -

**- END OF PAPER -**