**Institute of Systems Science**
**National University of Singapore**

# MASTER OF TECHNOLOGY IN SOFTWARE ENGINEERING

## Self Assessment Examination 2011

## Subject: *Software Project Management*

**Matriculation Number:**

*(fill in your matriculation number here)*

## Instructions for Paper

Date:
Time:              1:30 pm
Duration:          Three hours (2.00 p.m. to 5.00 p.m.)
Place:             ISS

**This is an OPEN BOOK examination. This examination paper consists of *two* Sections and *three* Questions. You are to answer *ALL* questions. There are a total of *70 Marks* for this paper.**

1.    The first 30 minutes are for reading and understanding the questions in this examination paper. You may **NOT** answer any questions in the answer books and attachments provided using any writing instrument during this time.

2.    Read **ALL** instructions before answering any of the examination questions.

3.    Write your matriculation number on the front page of the **question paper** in the box provided above.

4.    Write your matriculation number at the top of the **front page** of **each appendix** and **attachment** to the question paper.

5.    Complete the front cover of each answer book you use. The blank lines at the top of the front cover are to be filled in as follows:

Matric Number:        = *(Your matriculation number)*
Examination:          = *Self assessment Examination 2010*
Subject:              = *Software Project Management*
Paper Number:         = *n/a*

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6.      Write your matriculation number on **ALL** answer books you use.

7.      This is an *Open Book* examination. If you wish, you may use reference materials to answer a question. Reference materials can be *books, manuals, handouts* or *notes*.

8.      **Answers** are to be written **only** in the **answer books** and **attachments** provided.

9.      Use a **separate** **answer book** for **each** **section**.

10.     **Start** the answer to each question on a **NEW** page.

11.     Scrap paper may be used as required, but **only** answers written on the **answer books** and **attachments** will be considered for credit.

12.     Use a pen for writing your answers. Pencil may only be used for drawing diagrams and writing program code.

13.     Calculators may be used if required. **However, computers of any form (lap-top, palm-top etc) are not permitted to be brought into the examination hall.**

14.     State clearly any assumptions you make in answering any question where you feel the requirement is not sufficiently clear.

15.     At the end of the examination:

   a.      If you have used **more than one** answer book for a section, then **tie those books together** along with any attachments that may have been used. **List** the questions that you have answered for each section on the **front page** of the **first answer book** for that section.

   b.      Hand-in the answer books for **each** section **separately**:

      i.      **Do not** write the questions for more than one section in the same answer book.

      ii.     **Do not** tie together the answers books for more than one section.

   c.      Return your question paper, appendices and attachments. **You are not allowed to remove the question paper, appendices or attachments from the examination hall.**

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*REMEMBER:*

- *This is an OPEN BOOK exam.*
- *There are a total of 75 Marks for this paper.*
- *You are required to answer ALL questions.*
- *State clearly any assumptions you make in answering any question where you feel the requirement is not sufficiently clear.*

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# SECTION A

**Question 1** *(refer also to Appendix A)* *(Total: 30 Marks)*

Appendix A, entitled *Emergency Information System Project Description*, is a description of a project to produce an emergency system for the Singapore *National Emergency Authority*. Assume that you work for *Critical Systems Pte Ltd* - the system integrator that has been awarded the contract to undertake this project.

The current situation is that the contract has been awarded to *Critical Systems*. The high-level requirements have been reasonably well defined in a user requirements specification. Negotiations are still in progress with the vendors that will provide parts of the system.

You are currently planning the project. Answer the following questions:

a. The project strategy is heavily oriented towards the use of subcontractors. Identify **eight** risks associated with this strategy. What would you do to minimize the likely impact of **each** of these risks? *Note: the risks you identify must be specific to this project ie: not generic subcontracting risks.*

*(16 Marks)*

b. Define a project structure, clearly showing the project teams that you would construct and the management and reporting structure, including the management of subcontractors and vendors.

*(10 Marks)*

c. The main performance requirements of the system are as follows:

16. For data accessed by mobile units at the incident site, the system is required to be able to display one page of information in less than 5 seconds.

17. For other data accessed by office users, the system is required to be able to display one page of information in less than 2 seconds.

Which activities and deliverables would you include in your project plan to enable these requirements to be adequately addressed. Justify your answer by explaining how these activities and deliverables will be used to ensure that the system meets these requirements. *Notes: the deliverables you mention should be consistent with the documentation requirements defined in section 3 of appendix A.*

*(4 Marks)*

## SECTION B

**Question 2** *(refer also to Appendices B and C and Attachment 1)*        *(Total: 25 Marks)*

Assume that you are the project leader of the **Lee Realty Project**. It is now the evening of day 22 and you are assessing the current status of the project and determining the measures *(if any)* that are required to bring the project to a successful conclusion. The project plan and background are described in appendix B. Current progress and associated information are given in appendix C. Answer the following questions:

a.        Update the Gantt chart (**using a copy of attachment 2**) to show current progress.

*(5 Marks)*

b.        Identify the major problems that are impacting the Lee Realty Project.

*(5 Marks)*

c.        Describe your solutions to these problems.

*(5 Marks)*

d.        Produce a new plan for the project that should include
   - A new WBS and effort estimates (**using a copy of attachment 3**) and updated cost estimates for the project

*(5 marks)*
   - A new Gantt chart (**using a copy of attachment 1**)

*(5 Marks)*

**Question 3** *(refer also to Appendix D and Attachment 4)*          *(Total: 20 Marks)*

You are a manager working for the IT department of the **Asia Pacific Bank**. Recently the Bank has been exploring the possibility of developing an on-line Loan Application Facility that can be used by customers to apply for and obtain a loan of up to $50,000. The **Asia Pacific Bank** board of directors now wishes to determine whether to proceed with the Project or not .The criteria to be used in the decision process is whether the project will create a *Benefits Index of 200% two years after project inception*, where **Benefits Index** is given by:

$$\text{Benefits Index} = \frac{\text{Total benefits accumulated 2 years after project inception}}{\text{Total costs accumulated 2 years after project inception}} \times 100\%$$

**Note:** (1) This assumes no discounting.
          (2) Project inception starts at the beginning of the development of the project.

**You have been tasked with carrying out a cost-benefit analysis to determine if this project will be financially viable. The project is still in the feasibility study phase and no firm estimate of cost has been made. You must therefore:**

a.      Using the *Cost By Analogy* method, the project data presented in appendix D and the data concerning other Asia Pacific Bank projects given overleaf, prepare an estimate of the required development effort.

*(5 Marks)*

b.      Using the information in appendix D, determine the total development costs and the total development timescales for the project and create a table showing **quarterly** costs for both systems development and systems operation. Document your answer on **one or more copies of attachment 2.**

*(5 Marks)*

c.      Using the data in appendix D, prepare Best Case/Worst Case estimates of the benefits that will accrue to the project after initial operation of the on-line Loan Application Facility begins, and insert these in the table prepared in part (b) above.

*(5 Marks)*

d.      Prepare a one-page memorandum either recommending or rejecting development of this on-line Loan Application Facility.

*(5 Marks)*

# Data on Completed Projects

**The following information has been collected on projects recently completed by the Asia Pacific Bank IT Department.**

| Project | Size (Number of Web pages) | Language | Application Domain Familiarity | Familiarity with Technology/ Language | Actual Effort (man-days) | Project description |
|---------|----------------------------|----------|-------------------------------|---------------------------------------|--------------------------|---------------------|
| A | 9.00 | C # | High | Low | 60.00 | Front office system |
| B | 12.00 | C# | Low | Low | 96.00 | Front office system |
| C | 8.00 | JAVA 2 | Low | Low | 66.00 | Back office administration system |
| D | 16.00 | JAVA 2 | High | High | 100.00 | Product marketing website |
| E | 9.00 | PeopleSoft | Low | High | 508.00 | HR system with web interface |