PRINCE OF SONGKLA UNIVERSITY

FACULTY OF ENGINEERING

Midterm Examination: Semester 1 **Academic Year**: 2004-2005

Date: 4th August 2004 **Time**: 9.00-12.00 (3 hours)

Subject Number: 240-572 **Room**: R 300

Subject Title: Introduction to High Level Architecture and Creating Computer Simulation Systems

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Exam Duration: 3 hours

This paper has 3 pages and 2 questions. (Total marks: 100 marks)

Authorised Materials:

- Writing instruments (e.g. pens, pencils).
- This is an open-book exam: books, sheets and dictionaries are allowed.
- NO electronic devices are allowed: calculators, mobile phones, electronic dictionaries are NOT allowed.

Instructions to Students:

- Attempt all questions.
- Write your answers in an answer book.
- Start your answer to each question on a new page
- Clearly number your answers.
- Any unreadable parts will be considered wrong.

When drawing diagrams or coding, use good layout, and short comments.

Exam sheet by Pichaya Tandayya Tel. 7352

ทุจริตในการสอบ

โทษขั้นต่ำ ปรับตกในรายวิชานั้นและพักการเรียน 1 ภาคการศึกษา

โทษสูงสุด ให้ออก

Question 1 (50 marks; 80 minutes)

a) What are the benefits of the High Level Architecture to distributed interactive simulations? (5 marks)

b) What is interoperability? (5 marks)

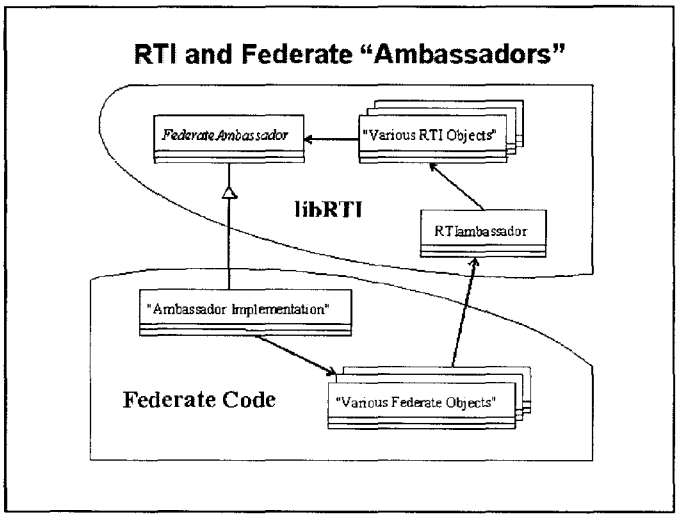
c) What are the differences between class-based and value-based data applications? (10 marks)

d) Explain the terms *'time constrained' and 'time regulating'* in HLA (10 marks)

e) What are the differences between *'Interaction'* and *'Object'* classes in HLA? Give examples for usage. (10 marks)

f) Illustrate and describe the different responsibilities for the federate code provided by the user and that provided by *libRTI* using the following diagram. (10 marks)

RTI and Federate Ambassadors



California State University, Chico (Figure from the Hands-on Practicum) 1/7/1999 8

Question 2 (50 marks; 100 minutes)

From the following environments, choose one environment for simulation. Design a class hierarchy of the related objects and their attributes.

- Transportation systems: Bus system, Railway system, Airline system
- Postal services
- Ticket service systems
- Mobile phone systems
- Computer network systems
- Traffic systems

a) Draw block diagrams and give explanation of the HLA federation from the chosen system. (10 marks)

b) Draw a *class hierarchy* with some example attributes from the chosen system. (5 marks)

c) Draw a *Venn diagram* from the chosen system. (5 marks)

d) Draft tables in the HLA *Object Model Template (OMT)* to give the design of data distribution of the federation from the chosen system. (10 marks)

e) Explain *interest expression* and *description expression* by giving example name spaces from the chosen system. (10 marks)

f) Explain the *alternate approach* and *extensibility* or *Type Promotion* in the HLA's Data Distribution by giving examples from the chosen system. (10 marks)

--- End of Examination ---