UNIVERSITI SAINS MALAYSIA

Second Semester Examination
Academic Session 2004/2005

March 2005

**CMT314 - Decision Support Systems & Intelligent Systems**

Duration : 2 hours

**INSTRUCTIONS TO CANDIDATES:**

* Please ensure that this examination paper contains **THREE** questions in **FOUR** printed pages before you start the examination.

* Answer **ALL** questions.

ENGLISH VERSION OF THE QUESTION PAPER

1. (a) (i) Draw a diagram to show the conceptual flow of a decision-making and modeling process. Briefly explain the activities in the Implementation phase.

(10/100)

(ii) Draw and briefly explain the Decision Support Framework proposed by Gorry & Scott Morton (1971).

(20/100)

(b) (i) What are the possible rationality assumptions?

(10/100)

(ii) Draw a diagram to show the relationships among the components of a decision support system. Describe the functions of each component.

(20/100)

(c) (i) How does Online Analytical Processing (OLAP) differ from Online Transaction Processing (OLTP)?

(10/100)

(ii) Describe multidimensionality and explain its potential benefits for Management Support Systems.

(30/100)

2. (a) (i) Briefly explain the following terms:

• Information
• Knowledge
• Business Intelligence
• Business Analytics
• Data Mining

(10/100)

(ii) Draw and describe a data warehouse framework.

(20/100)

(iii) Draw and briefly describe a time/place framework for classifying information communication support technologies.

(20/100)

(b) Describe the differences between each of the following pairs:

(i) Natural intelligence and artificial intelligence.

(ii) Information system and expert system.

(iii) Domain expert and knowledge engineer.

(30/100)

(c) What is Repertory Grid Analysis? How is the Triadic Elicitation method of Repertory Grid Analysis carried out?

(20/100)

3. (a) Briefly describe the following:

(i) Inferencing with rules

(ii) Inferencing with frames

(iii) Model-based reasoning

(30/100)

(b) Consider an artificial neural network with one (1) processing element to learn the AND operation. There are two input elements, $X_1$ and $X_2$. These inputs and the desired output can be shown as follows:

| Inputs | | |
|---|---|---|
| $X_1$ | $X_2$ | Desired Output |
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

(i) Draw and fill in a table to illustrate the learning of the artificial neural network. Assume that:

- the initial weights for the inputs are both 0.8,
- the learning rate is 0.2, and
- the transformation function is not used but a threshold value is set instead. Any value 0.5 or less becomes 0, and any value more than 0.5 becomes 1.

(ii)  How many cycles does it take for the learning to be completed?

(30/100)

(c)  Describe fuzzy logic and qualitative reasoning by highlighting their differences. Give examples to illustrate your answer.

(20/100)

(d)  How far should intelligent systems be used in our daily lives?  Are they suitable for all domains?  Discuss briefly.

(20/100)

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