

**UNIVERSITI SAINS MALAYSIA**

**Second Semester Examination  
Academic Session 2004/2005**

**March 2005**

**CPT317 - Knowledge Management & Engineering**

**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) Explain the differences between the follow:

- (i) Data and knowledge.
- (ii) "Obtain" and "receive" knowledge modelling transfer functions.
- (iii) Validation and verification.

(30/100)

(b) Consider the following training-related description and answer the questions that follow using the conventions defined under the CommonKADS methodology.

Each applicant's record has the following attributes:

- Name
- Identity card number
- Year of study (1, 2, or 3)
- Specialisation (software engineering, information engineering, or computer systems)
- Minor (management, or others)
- Units accumulated
- Academic status (active, P1, P2, or FO)
- Overall CGPA
- CGPA of prerequisite courses
- English requirements (fulfilled, or not fulfilled)

Each training organisation's record has the following attributes:

- Name of organisation
- Type of organisation (manufacturing, software, consulting, research, training, or retail)
- Contact person

- (i) Write CONCEPT (with relevant VALUE-TYPE) definitions for the applicant and for the training organisation. Use suitable abbreviations in your definitions.
- (ii) Define a BINARY-RELATION called *applicant-organisation* to express the relationship between the applicant and training organisation concepts.

- (iii) Write definitions for a KNOWLEDGE-BASE called *unit\_year\_mapping* and a relevant RULE-TYPE called *unit\_year\_rule* to map an applicant's units accumulated to the year of study. Let us assume that 0-35 units = Year 1; 36-71 units = Year 2; and 72 units or more = Year 3. Let us also assume that the DOMAIN-SCHEMA concerned is called *training\_application\_schema*.
- (50/100)
- (c) List and describe the elements of the script knowledge representation. Write a simple script as an example to illustrate your answer.
- (20/100)
2. (a) Forward and backward chaining are popularly used on which knowledge representation? Briefly describe how chaining is carried out and highlight the main differences between forward and backward chaining.
- (25/100)
- (b) Define data mining and describe four (4) types of data mining tasks. Discuss the role of data mining in the context of knowledge engineering.
- (25/100)
- (c) List and briefly describe the processes of knowledge management.
- (25/100)
- (d) Describe knowledge creation according to Nonaka's five-phase model and describe where the modes of knowledge conversion are used.
- (25/100)
3. (a) Briefly explain the structure of scenarios that are used in tacit knowledge explication. How are these scenarios different from scripts?
- (20/100)
- (b) Describe **four (4)** types of organisational memory.
- (30/100)

(c) Discuss the following:

- (i) Knowledge economy.
- (ii) Organisational learning.
- (iii) Communities of practice.

(30/100)

(d) Discuss the problems and challenges faced in knowledge management.

(20/100)