

UNIVERSITI SAINS MALAYSIA

Peperiksaan Semester Pertama
Sidang Akademik 1996/97

Oktober/November 1996

EEE 447 - Kecerdasan Mesin

Masa : [3 jam]

ARAHAN KEPADA CALON :

Sila pastikan bahawa kertas peperiksaan ini mengandungi **ENAM (6)** muka surat bercetak dan **ENAM (6)** soalan sebelum anda memulakan peperiksaan ini.

Jawab **LIMA (5)** soalan.

Agihan markah bagi soalan diberikan di sut sebelah kanan soalan berkenaan.

Jawab semua soalan di dalam Bahasa Malaysia.

1. (a) Bandingkan secara terperinci diantara kecerdikan asli dan buatan.
Compare and contrast between artificial and natural intelligence. (25%)
- (b) Bezakan diantara data, informasi dan maklumat.
Distinguish between data, information and knowledge. (15%)
- (c) Terangkan perbezaan diantara pemrograman konvensional dan pemrograman sistem mahir. Apakah kelebihan sistem mahir dan di manakah kegunaan utama baginya?
Explain the differences between conventional programming and expert system programming. What are the benefits of expert system and where are their main applications? (40%)
- (d) Diberikan fungsi dan program LISP berikut,
Given the following LISP assignment and program definition,
- (i) Apa yang dilaksanakan oleh program?
What does the program do?
- (ii) Apakah hasil apabila dikenakan recur kepada friends?
What is the result of the application of recur to friends?
- ```
> (setq friends '(yeop tan muthu))

(defun recur (alist)
 (cond
 ((not (null (cdr alist)))
 (recur (cdr alist)))
 (t alist)))
```
- (20%)

2. (a) Takrifkan dan jelaskan maklumat cetek dan dalam. Berikan contoh-contoh mengenai jenis maklumat di atas.  
*Define and elaborate shallow and deep knowledge. Give examples of each of the above knowledge.*  
(30%)
- (b) Bandingkan dengan jelas maklumat deklaratif dan procedural.  
*Compare and contrast declarative and procedural knowledge.*  
(30%)
- (c) Apakah 'metaknowledge'  
*What is metaknowledge?*  
(10%)
- (d) Bandingkan kebaikan dan kelemahan beberapa jenis perwakilan maklumat.  
*Compare the advantages and disadvantages of the different kinds of knowledge representations.*  
(30%)
3. (a) Dengan menggunakan contoh, terangkan bagaimana rangkaian semantik digunakan bagi perwakilan maklumat dalam AI.  
*Using an example, describe how a semantic network is used in AI knowledge representation.*  
(40%)
- (b) Menggunakan maklumat yang diberikan mengenai sebuah organisasi binakan suatu bentuk perwakilan frem baginya:-
- Syarikat Mison: 1,050 pekerja, \$130 juta jualan tahunan, Mike Tyson ialah Presiden
  - Departmen: akaun, kewangan, pemasaran, pengeluaran, personel
  - Departmen pengeluaran: lima 'line' pengeluaran
  - Produk: komputer
  - Budget tahunan:  $RM100,000 + RM6,000 \times \text{jumlah komputer yang dihasilkan}$

...4/-

- Bahan: RM3,000 per unit yang dihasilkan
- Hari bekerja: 250 setahun
- Jumlah penyelia: satu bagi setiap 12 operator
- Julat bilangan operator: 400-500 satu shift (dua shift satu hari).  
'Overtime' bagi shift ketiga dibenarkan.

Express the following given information of an organisation in a form of frame representation:-

- *Mison Company: 1,050 employees, \$130 million annual sales, Mike Tyson is the President*
- *Departments: accounting, finance, marketing, production, personnel*
- *Production department: five line of production*
- *Product: computers*
- *Annual budget: RM100,000 + RM6,000 x number of computers produced*
- *Materials: RM3,000 per unit produced*
- *Working days: 250 per year*
- *Number of supervisors: one for each twelve operators*
- *Range of number of operators: 400-500 per shift (two shifts per day).  
Overtime on a third shift is possible.*

(60%)

4. (a) Terangkan mekanisma keadaan-keadaan padan-pilih-laksana berkaitan dengan proses inferens bagi suatu sistem produksi. Jelaskan mengapa sistem seperti itu dipanggil "terpandu-data".

*Explain the mechanism of match-select-execute states cycle as applied to the inference process of a production system. Elaborate why such a system is termed as "data-driven".*

(40%)

- (b) Dengan menggunakan contoh-contoh, terangkan perbezaan di antara rantaian depan dan belakang dan dalam keadaan macam manakah ianya sebaiknya digunakan.

*Using examples, explain the differences between forward and backward chaining and under what conditions each would be best used.*

(40%)

- (c) Terangkan mana-mana dua kaedah carian yang terdapat dalam AI.

*Describe any two search techniques in AI*

(20%)

5. Bila anda mulakan KAPPA, anda akan dipaparkan tool-tool berikut:-

*When you first start KAPPA, you will be presented with the following tools:-*

1. 'Object Browser'
2. 'Knowledge Tools'
3. 'KAL Intepreter'
4. 'Session window'
5. 'Rule Relations'
6. 'Rule trace'
7. 'Inference Browser'

Anda dikehendaki membina suatu sistem berasaskan maklumat bagi suatu aplikasi pilihan sendiri. Terangkan bagaimanakah anda menggunakan tool-tool yang ada bagi menrealisasikan sistem anda mulai dari perwakilan maklumat hingga menjalankan sistem dengan sempurna.

*You are required to develop a knowledge based system, using the above tools, for an application of your choice. Describe how would you realise your system from knowledge representation to properly running the system.*

(100%)

6. Tulis nota pendek mengenai mana-mana empat dari tajuk berikut:-  
*Write short notes on any four of the following:-*

- i. Pembelajaran mesin/*Machine learning*
- ii. Sistem fuzzy/*Fuzzy systems*
- iii. Pemprosesan Bahasa Asli/*Natural language processing*
- iv. Rangkaian Neural/*Neural networks*
- v. Penglihatan mesin/*Machine vision*

(100%)

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