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**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2011/2012**

**COURSE NAME : ARTIFICIAL INTELLIGENCE**  
**COURSE CODE : BIT 20903 / BIT 2093**  
**PROGRAMME : BACHELOR OF INFORMATION  
TECHNOLOGY**  
**EXAMINATION DATE : JANUARY 2012**  
**DURATION : 2 HOURS 30 MINUTES**  
**INSTRUCTION : ANSWER ALL QUESTIONS.**

**THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES**

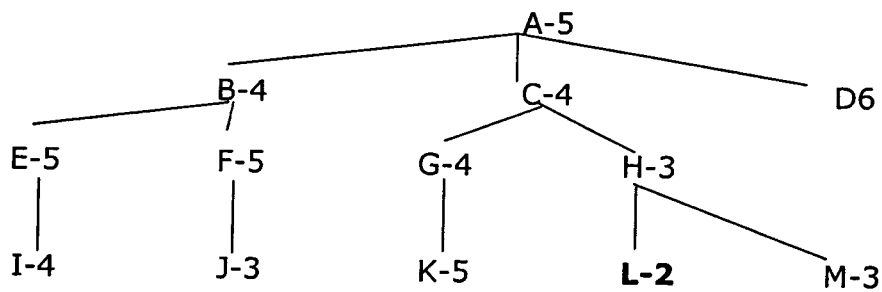
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Instruction: Answer ALL questions.

**Q1** Define each of the following terms:

- (a) Artificial Intelligence (2 marks)
- (b) Semantic Network (2 marks)
- (c) Knowledge Base (2 marks)
- (d) Inference Engine (2 marks)
- (e) Backward Chaining (2 marks)

**Q2** (a) Traverse the tree according to breadth first search with **L2** as its goal.



(6 marks)

(b) State **ONE (1)** advantage and **ONE (1)** disadvantage of Hill Climbing

(4 marks)

- Q3**
- (a) State **TWO (2)** main participants involve during expert system development (2 marks)
  - (b) There are two type of interview technique for expert system, structured and unstructured interview. Give **TWO (2)** differences between them. (4 marks)
  - (c) Expert system is needed in assisting human expert. Why? Give **TWO (2)** reasons. (4 marks)
- Q4**
- (a) Translate each of the following sentences into a statement in the predicate calculus.
    - (i) Syaheed is a taxi driver (1 marks)
    - (ii) Every taxi driver will travel to at least three states (3 marks)
    - (iii) Some taxi driver will travel to every state (3 marks)
    - (iv) Every state will be visited by some taxi driver (3 marks)
  - (b) Using truth table, prove the followings statement:  
 $((A \rightarrow B) \wedge \neg B) \rightarrow \neg A$  (10 marks)
- Q5**
- (a) Give **ONE (1)** example for the following reasoning.
    - (i) Deductive reasoning (3 marks)
    - (ii) Inductive reasoning (3 marks)
    - (iii) Analogical reasoning (3 marks)

(b) Draw semantic network from the given facts.

- A chicken is a bird*
- Chicken has wings*
- Bird has wings*
- Bird has two legs*
- Bird is food*
- Bird is animal*
- An orange is a fruit*
- Fruit has a stem*
- Fruit is food*
- Fruit is vegetable*
- An animal is a living thing*
- A vegetable is a living thing*

Applicant C

(11 marks)

Q6 Based on the Table 1, translate into Prolog clauses for the Job Application Status. It should contain rules and facts that used to consider the job application status. Used *applicant*, *CGPA*, *experience*, *statusrejected* and *statusaccepted* as your predicates.

Table 1: Job Application Status

Applicant	CGPA	Experience
Tiffany	2.9	1 year
Sunny	3.5	2 year

$$y \geq 3.0$$

$$CGPA \quad y \geq 3.0$$

$$z \geq 1$$

**Additional rules:**

Application will be accepted if CGPA is 3.0 and above and experience is 1 year and above.  
 Application will be rejected if CGPA below 3.0 and experience is below 1 year.

(15 marks)

Q7 (a) Neural network is inspired by the way biological nervous systems such as brain neuron function. Draw biological neuron and artificial neuron.

(6 marks)

- (b) **Table 2** shows the weight for 10 students in Class B1. Based on **Table 2**, construct one fuzzy set for variable weight.

Table 2: Weight of students in Class B1

Janet	96	1
Bakri	89	1
Alex	88	1
Chen	72	1
Zaini	67	1
Zizan	63	1
Gurusamy	59	0
Siti Shahira	55	0
Zoe	52	0
Syahida	48	0
Mazni	45	0
Tasya	43	0

*membership  
of  
degree*

(6 marks)

- (c) Neural network and fuzzy logic are one of artificial intelligence area that had been applied in many domains, such as medical, business, education, geological, chemistry and others. Discuss **ONE (1)** application for neural network.

(3 marks)