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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2018/2019**

COURSE NAME : ARTIFICIAL INTELLIGENCE
COURSE CODE : BIT 20903
PROGRAMME CODE : BIT
EXAMINATION DATE : DECEMBER 2018 / JANUARY 2019
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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TERBUKA

Q1 Answer **Q1 (a)** and **Q1 (b)** based on **Figure Q1**.

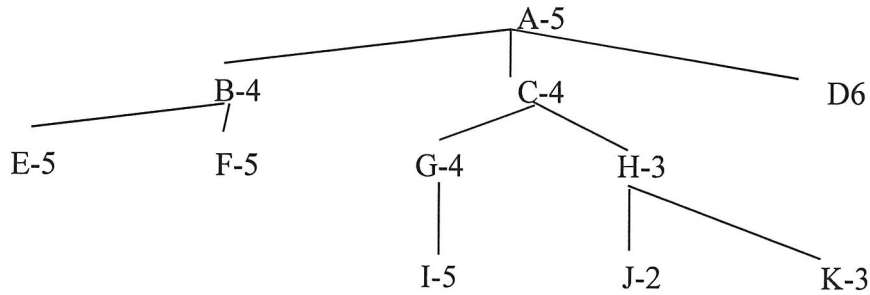


Figure Q1

- (a) Traverse the tree using Breadth First Search with **K** as its goal. (10 marks)
- (b) Traverse the tree using Best First Search with **K** as its goal. (10 marks)

Q2 (a) Using truth table, prove the following statement:

$$(\neg Q \wedge (P \rightarrow Q)) \rightarrow \neg P$$

(10 marks)

- (b) Represent the statements in **Q2 (b) (i)** and **Q2 (b) (ii)** as propositional logic expressions based on **Figure Q2**.

P = "Aman is healthy"
 Q = "Aman is wealthy"
 R = "Aman is wise"

Figure Q2

- (i) Aman is healthy and wealthy but not wise.
- (ii) Aman is neither healthy nor wealthy nor wise. (5 marks)

Q3 Translate each of the following sentences into a statement in the predicate calculus.

- (a) Bobo is a cheetah. (1 mark)
- (b) Sally is Bobo's master. (2 marks)
- (c) The day is Sunday. (2 marks)
- (d) It is cold in Sunday. (2 marks)
- (e) Bobo is trained. (2 marks)
- (f) Sumatran tiger are tame tiger and so are trained cheetah. (3 marks)
- (g) If it is Sunday and warm, then Sally is at the park. (3 marks)

Q4 Draw a semantic network from the given facts in **Figure Q4**. (10 marks)

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

Figure Q4



- Q5** 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. 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.

Table 1: Job Application Status

Applicant	CGPA	Experience
Tina	2.9	1 year
Sally	3.5	2 year

(15 marks)

- Q6** (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. Give **TWO (2)** reasons.
(4 marks)

Q7 (a) Neural network is inspired by the way biological nervous systems such as brain neuron function. Draw biological neuron and artificial neuron. (4 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: Student's Weight

Student Name	Weight (kg)	Classic Set
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

(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 many others. Discuss **ONE (1)** application for neural network.

(5 marks)

-END OF QUESTION-

