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Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

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

THIS QUESTION PAPER CONSISTS OF **SIX (6)** PAGES

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TERBUKA

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

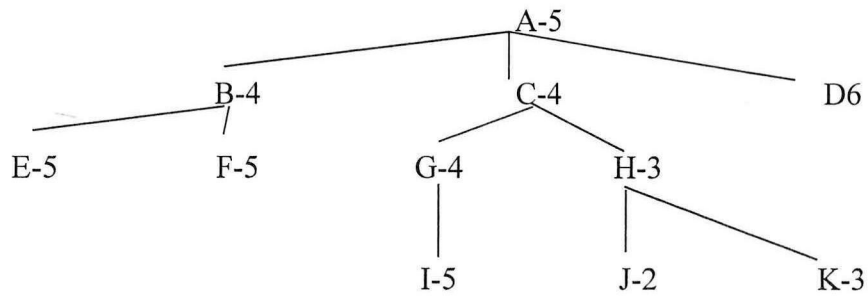


Figure Q1

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

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

(i) $\neg p \vee q = \neg p \wedge \neg q$ (5 marks)

(ii) $(\neg(p \wedge q)) \wedge (p \vee \neg q)$ (5 marks)

- Q3** (a) Let consider a propositional in **Figure Q3**. Write propositional logic for statements **Q3 (a) (i)** to **Q3 (a) (iii)**

P means "David is happy"
Q means "David paints a picture"
R means "Sally is happy"

Figure Q3

- (i) If David is happy and paints a picture then Sally isn't happy. (2 marks)
- (ii) If David is happy, then she paints a picture. (2 marks)
- (iii) David is happy only if she paints a picture. (2 marks)
- (b) Translate each of the following sentences from **Q3(b)(i)** to **Q3(b)(v)** into a statement in the predicate calculus. Add quantifier if suitable.
- (i) Marry bought a television. (2 marks)
- (ii) Marry bought something. (2 marks)
- (iii) Everyone bought something. (2 marks)
- (iv) Someone bought everything. (2 marks)
- (v) Ben bought everything that Marry bought. (3 marks)
- (vi) If Marry bought everything, so did Ben. (3 marks)

Q4 (a) State **TWO (2)** main participants involve during expert system development.

(2 marks)

(b) Give **TWO (2)** differences between structured and unstructured interview.

(4 marks)

(c) Expert system is needed in assisting human expert. Give **TWO (2)** reasons.

(4 marks)

Q5 Convert semantic network diagram in **Figure Q5** to frame representation.

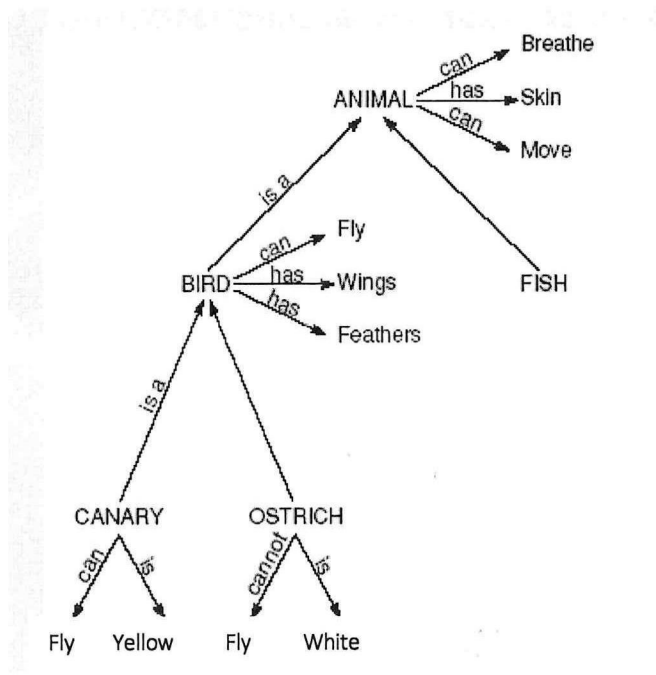


Figure Q5

(10 marks)

Q6 Based on the **Table 1**, translate into Prolog clauses for the Loan Application Status. It should contain rules and facts that used to consider the loan application status. Used `applicant`, `salary`, `debt`, `statusrejected` and `statusaccepted` as your predicates. Application will be accepted if salary more than RM 3000 and debt per month below RM 800. Application will be rejected if salary less than RM 3000 and debt per month more than RM 800.

Table 1: Loan Application Status

Applicant	Salary	Debt
Faizal	5000	700
Siti	3500	1200

(15 marks)

- Q7** (a) Neural network is inspired by the way biological nervous systems such as brain neuron function. Discuss why do human need “brain-like” computing. (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) Fuzzy logic is 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 fuzzy logic. (5 marks)

-END OF QUESTIONS-