



THE OPEN UNIVERSITY OF SRI LANKA

B.Sc DEGREE PROGRAMME: LEVEL 04

OPEN BOOK TEST: 2011/2012

CSU2280: DEDUCTIVE REASONING AND PROLOG FOR ARTIFICIAL INTELLIGENCE

DURATION: ONE AND HALF HOURS (1 ½ HOURS)

Date: 03rd September, 2011

Time: 9.00 am – 10.30 am

Answer ALL questions.

Q1.

- a) What is meant by *Reasoning*?
- b) With a suitable example(s) explain the following reasoning techniques.
 - i. Deductive reasoning
 - ii. Search and Match reasoning
 - iii. Analogical reasoning
- c) Explain the suitable reasoning technique that can be used to solve each of the following problems.
 - i. To find the particular image pattern in a given picture
 - ii. To develop a fully automated system for a military base
 - iii. To find the student results for Grade 5 examination
 - iv. To design and develop a computer model for a new processor

Q2.

- a) What are *Syllogisms*?
- b) Construct truth tables to represent the following terms.
 - i. Tautology
 - ii. Contradiction
 - iii. Model assignment
- c) Using truth tables establish the following relationships.
 - i. $P \rightarrow Q \equiv \neg P \vee Q$
 - ii. $\neg(P \vee Q) \rightarrow \neg P \wedge \neg Q$
 - iii. $(A \vee B) \rightarrow (C \wedge D) \equiv \neg(A \vee B) \vee (C \wedge D)$

Q3.

- a) What are the key limitations of *propositional logic*?
- b) Using your own words, explain the meaning of the following logic formulae.
 - i. $\exists x F(x)$
 - ii. $\exists x \forall y F(x, y)$
 - iii. $\forall x P(x) \wedge \forall y F(y)$
- c) Translate the following expressions of propositional logic into English.
 - i. $A \wedge B \wedge \neg C$
 - ii. $(A \vee B \vee \neg C) \rightarrow (A \wedge C)$
- d) Convert the facts in the following paragraph into propositional logic.

If there are high-quality computers, the students score high marks at their examination. If their self-confidence is low then they score low marks. It is said that the self-confidence of the students is low.

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