THE OPEN UNIVERSITY OF SRI LANKA
B.Sc DEGREE PROGRAMME: LEVEL 04

CLOSED BOOK TEST: 2011/2012

CSU 2280: DEDUCTIVE REASONING AND PROLOG FOR ARTIFICIAL INTELLIGENCE

DURATION: **ONE AND HALF HOURS** (1 ½ HOURS)

Date: **29th October, 2011** Time: **9.00 am – 10.30 am**

Answer ALL questions.

Q1.

a) "Prolog is a successful programming language for AI" Do you agree with this statement? Explain briefly.

b) What are the *Facts* and *Rules* in PROLOG?

c) Implement the following relations by using PROLOG.

Male – gunadasa, amara, sunil, kumara, kasun

Female – seela, Champa, nimalee, ganga, ruvini, Geethi

Parent	Children
Gunadasa, Seela	Amara, Champa, Nimalee
Kumara, Nimalee	Ganga, ruvini
Amara, Geethi	Kasun

d) Create PROLOG rules to implement the following;

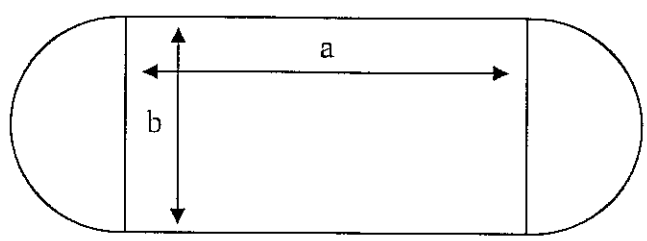
i. `mother/1` print the mother's name for the given child

ii. `grand_father/1` print the grand father's name for the given child

iii. `children_names/1` print the children's names for the given parent

Q2.

a) Write a PROLOG program to calculate the area of the following figure.
(a and b are inputs)



b) Calculate the grade of the given marks by using,

i. Number of PROLOG rules (Without using if statements)
ii. A Single rule with if then else statements

$0 < M < 35 \quad - F$

$35 <= M < 50 - S$

$50 <= M < 70 - B$

$70 <= M < 100 - A$

(Use the above defined ranges of marks.)

c) Create PROLOG rules to do the following list operations.

i. Print a given list with the following format

```
? printList([a,b,c,4,d]).
Element 1 : a
Elemenr 2 : b
.
.
Element n : d
```

ii. Print elements in two list, one element after another

```
? printList([a,b,c,d], [1,2,3]).
Elements : a1
Elemenrs : b2
Elements : c3
Elements : d
```

Q3.

a) Briefly explain the following PROLOG terms.

i. `setof/3` and `bagof/3`
ii. `assert/1`

b) Implement the following table as a PROLOG database.

Student table:

IndexNo	Name	Age	Sex
A0011	S. K. Perera	34	M
A0012	M. S. Gunapala	32	M
A0013	N. S. Silva	30	F
A0014	R. T. Weeresinghe	28	F

c) Create PROLOG rules to implement the following operations.

i. Add a new student

ii. Delete an existing student

iii. Update an existing student of a given index no.

iv. Print the student list with name and the index no.

v. Print the male student names whose age is greater than 31 years