

SOLUTION NOTES

Introduction to Functional Programming 2003 Paper 12 Question 10 (AD)

```
1.  datatype bool_exp = Var of string
      | Conj of bool_exp * bool_exp
      | Disj of bool_exp * bool_exp
      | Neg of bool_exp;
```

[4 marks]

```
2. fun variables (Var a) = [a]
      | variables (Conj(a,b)) = append (variables a) (variables b)
      | variables (Disj(a,b)) = append (variables a) (variables b)
      | variables (Neg a) = variables a;
```

[8 marks]

```
3. fun var_eval s [] = raise Error
      | var_eval s ((s,t)::l) = t
      | var_eval s (_::l) = var_eval s l;
```

```
fun eval (Var s) a = var_eval s a
      | eval (Conj(e1,e2)) a = (eval e1 a) andalso (eval e2 a)
      | eval (Disj(e1,e2)) a = (eval e1 a) orelse (eval e2 a)
      | eval (Neg e) a = not (eval e a);
```

[8 marks]