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Total No. of Questions :8]

SEAT No. : ____

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[5333] - 1001

M.Sc. (Computer Science)

CS - 101 : PRINCIPLES OF PROGRAMMING LANGUAGES

(2013 Pattern) (Semester - I)

Time : 3 Hours] ***[Max. Marks :50***

Instructions to the candidates:

1) ***Attempt any Five Questions.***
2) ***Draw a diagram wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) Attempt the following:

a) What are the programming language spectrum. **[4]**

b) Explain the differences between compilation and interpretation. **[4]**

c) Define prolog and states which are 2 types of databases support it. **[2]**

Q2) Attempt the following:

a) State the differences between CONS and Append primitives in LISP with example. **[4]**

b) Explain garbage collection mechanism. **[4]**

c) What is iterator? What are two programming languages that supports iterator. **[2]**

Q3) Attempt the following:

a) Explain slice mechanism. **[4]**

b) Discuss the design issues of subprograms. **[4]**

c) What is overloaded subprogram? What are the programming languages which has predefined overloaded subprograms. **[2]**

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Q4) Attempt the following:

a) Explain CUT predicate. Also explain how it is used in combination with FAIL predicate. **[4]**

b) Explain the distinction between decision that are bound statically and those that are bound dynamically. **[4]**

c) What is l-value? An r-value. **[2]**

Q5) Attempt the following:

a) Explain tombstone mechanism. **[4]**

b) Consider the following (erroneous) **[4]**

Program in C :

```
void foo( )
{
    int i ;
    printf("%d," i++) ;
}
main( )
{
    int j ;
    for (j=1 ; j<=10 ; j++)
    foo( ) ;
 }
```

Local variable i in a subroutine foo is never initialized. On many system however the program will display repeatable behaviour, printing 0123456789. Suggest an explanation. Also explain why the behaviour on the other system might be different on non deterministic.

c) Define **[2]**

i) List in LISP

ii) Unification in PROLOG.

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Q6) Attempt the following:

a) Explain initialization and assignment in C++ with suitable example. **[4]**

b) What is concurrency? Explain the categories of concurrency. **[4]**

c) Define virtual and non-virtual methods. **[2]**

Q7) Attempt the following:

a) Explain the connection between dynamic method binding and polymorphism. **[5]**

b) Explain the differences between declarative languages and imperative languages and explain late binding. **[5]**

Q8) Attempt the following:

a) Explain iteration and recursion with example. **[5]**

b) Write C/C++ function that declares an array statically on the stack and on the heap. Explain which one is more efficient. **[5]**