

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1469

Roll No.

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MCA

SECOND SEMESTER EXAMINATION, 2005-2006

PARADIGM OF PROGRAMMING LANGUAGE

Time : 3 Hours

Total Marks : 100

- Note :**
- (i) Attempt **ALL** questions.
 - (ii) All questions carry equal marks.
 - (iii) In case of numerical problems assume data wherever not provided.
 - (iv) Be precise in your answer.

1. Attempt **any four** parts of the following : (5x4=20)

(a) Discuss the attributes of a good programming language.

(b) Consider the following simple language. a and b represent names of integer variables. Each statement may have a label as a prefix. Statements in the language are as follows :

a = b Assign a the value of b

a = a + 1 Add 1 to a

a = a - 1 Subtract 1 from a

If a = 0 then goto L If a = 0 transfer control to L

If a > 0 then goto L If a > 0, transfer control to L

goto L Transfer control to L

halt Stop the execution

write a program in above language to calculate
a = a + b.

- (c) How the knowledge of a programming language can be beneficial for us.
- (d) Explain the different phases of compiler by drawing suitable diagram.
- (e) Write the difference between translation and simulation.
- (f) Explain the different binding and binding times by giving examples.

2. Attempt *any four* parts of the following : (5x4=20)

- (a) What are different elements of specification of a data type? Also discuss ways of implementation of operations.
- (b) What are the main purposes of declaration? What could be the reasons that some languages do not use concept of declaration.
- (c) Discuss type checking and type conversion.
- (d) Derive an expression for calculating an address of a specific element in a single and two dimensional array stored in row major order. Make the required assumptions.
- (e) Implementation of sub-program call and return is normally done using concept of Current Instruction Pointer (CIP) and Current Environment Pointer (CEP). Making use of CIP and CEP discuss implementation of recursive sub-program.
- (f) Explain the different parameter passing techniques giving suitable examples.

3. Attempt *any two* parts of the following : (10x2=20)

- (a) How object oriented languages support information hiding and data abstraction. Explain in detail giving suitable example.
- (b) Write short notes on :
 - (i) Polymorphism
 - (ii) Inheritance
 - (iii) Operator overloading
- (c) Write a program in any object oriented language for implementation of a stack.

4. Attempt *any two* parts of the following : (10x2=20)

- (a) With reference to functional programming explain the following term:
 - (i) Function declaration
 - (ii) Recursive function
 - (iii) Type inference
- (b) What are the three ways that ML is very different from scheme. Also explain the lazy evaluation.
- (c)
 - (i) Explain the exception handling in ML.
 - (ii) What does the following scheme function do ?

```
(define (y s Lis)
(cond
((null ? Lis) '())
((equal ? s (car Lis)) Lis)
(else (y s (cdr Lis))))
```

5. Attempt *any two* parts of the following : (10x2=20)

(a) Given the relations :

Father (x, y) x is the father of y

Mother(x, y) x is the mother of y

Female (x) x is the female

Male (x) x is male

Define the relation of the following

(i) Sibling

(ii) Sister

(iii) Grandson

(iv) First cousin

(v) Descendent.

(b) Define relations., Rules and facts, queries, existential queries, universal facts and rule and unification.

(c) Write short notes on :

(i) SLD resolution

(ii) Negation as failure extension.

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