Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: CS403
Course Name: PROGRAMMING PARADIGMS

Max. Marks: 100   Duration: 3 Hours

PART A
Answer all questions, each carries 4 marks.
Marks

1	What is binding time? Explain the distinction between the lifetime of a name to object binding and its visibility.	(4)
2	Does C have enumeration controlled loops? Explain.	(4)
3	What is a dope vector? What purpose does it serve?	(4)
4	What is a higher order function? Give three examples.	(4)
5	What are facts, rules and queries?	(4)
6	How does an in-line subroutine differ from a macro?	(4)
7	Explain how reader writer lock differs from a normal lock.	(4)
8	What is busy waiting? What is its principal alternative?	(4)
9	Does a constructor allocate a space for an object? Explain.	(4)
10	What is a V-table? How is it used?	(4)

PART B
### *Answer any two full questions, each carries 9 marks.*

11 a) From the given fragment of code, identify the scope of each names used in code and   (6)
also define closest nested scope rule.

```
procedure P1(A1 : T1);
var X : real;
...
procedure P2(A2 : T2);
...
procedure P3(A3 : T3);
...
begin
... (* body of P3 *)
end;
...
begin
... (* body of P2 *)
end;
...
procedure P4(A4 : T4);
```

```
...
function F1(A5 : T5) : T6;
var X : integer;
...
begin
... (* body of F1 *)
end;
...
begin
... (* body of P4 *)
end;
...
begin
... (* body of P1 *)
end
```

b) C language is not a strongly typed language. Can you give the reason that prevents C   (3)
to be strongly typed language?

12 a) With help of given figure, Show how static and dynamic link works?   (5)

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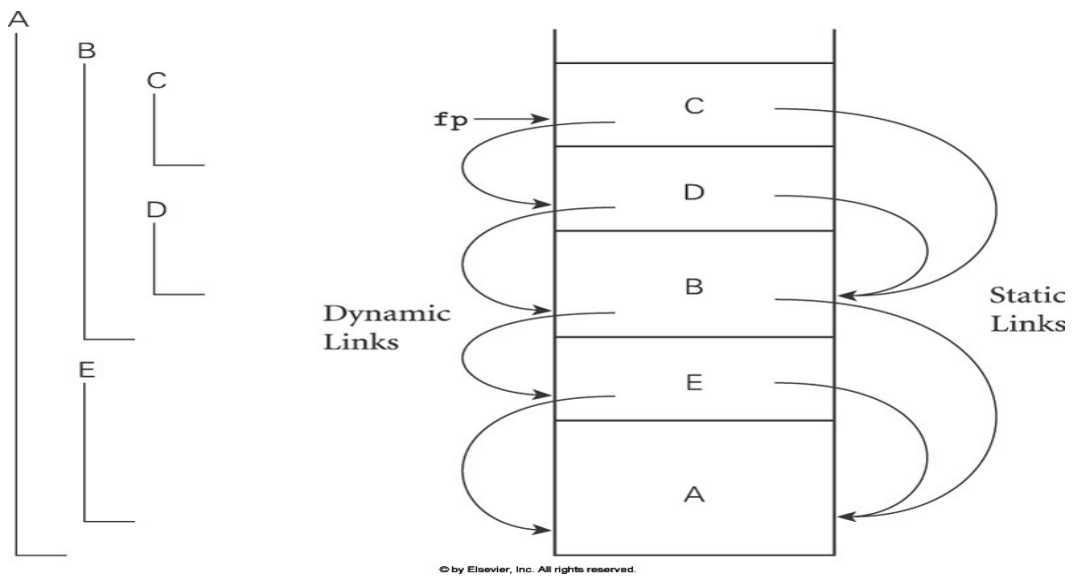
b) What is the difference between value model of variables and a reference model of   (4)
variables? Why is the distinction important?

13 a)   (6)

Consider the following records of a particular language. Let the size of each char
variable be 1 byte, int be 4 bytes and float be 8 bytes.

                 1) struct student   **2) union student**

```
{                                          {
    char name[2];                              char name[2];
    int age;                                   int age;
    float mark;                                float mark;
}                                          }
```

Draw the memory layout for the records (1) and (2) for a 32-bit aligned machine.

b) Explain the difference among strict and loose name equivalence   (3)

PART C
Answer any two full questions, each carries 9 marks.

14 a) Describe four parametric-passing modes. How does a programmer choose a parameter mode in a particular scenario   (6)

b) Describe three alternative means of allocating co-routine stacks.   (3)

15 a) What is a subroutine calling sequence? What does it do? What is meant by subroutine prologue and epilogue?   (6)

b) How let and letrec constructs work in scheme?   (3)

16 a) rainy(seattle).   (6)
rainy(rochester).
cold(rochester).
snowy(X) :- rainy(X), cold(X).

From the above facts and rules, explain the backtracking strategy in Prolog.

b) Draw a DFA to accept all strings of zeros and ones containing an even number of each. How a Scheme interpreter works in this case?   (3)

PART D
Answer any two full questions, each carries 12 marks.

17 a) Generate strings and output from the following pattern   (9)

      i)   /a(bc)?/
      ii)   /a(bc)+/
      iii)   /a(bc){3}/
      iv)   /a(bc){2,}/
      v)   /a(bc){1,3}/
      vi)   /b[aeiou]d/
      vii)   /0x[0-9a-fA-F]+/
      viii) $foo = "albatross";
             $foo =˜ s/[aeiou]/-/g;
      ix) $foo = "albatross";
             $foo =˜ s/lbat/c/;

b) Explain the difference between dynamic and static method binding   (3)

18   a)   What are characteristics of scripting language? Explain in detail   (7)

      b)   Summarize the architecture of Java Virtual Machine   (5)

19   a)   Explain the various synchronization mechanism used in busy wait synchronization?   (6)

      b)   With a neat diagram explain the architecture of threads   (6)

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