

Reg No.: _____

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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 also define closest nested scope rule. (6)
- ```

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);

```

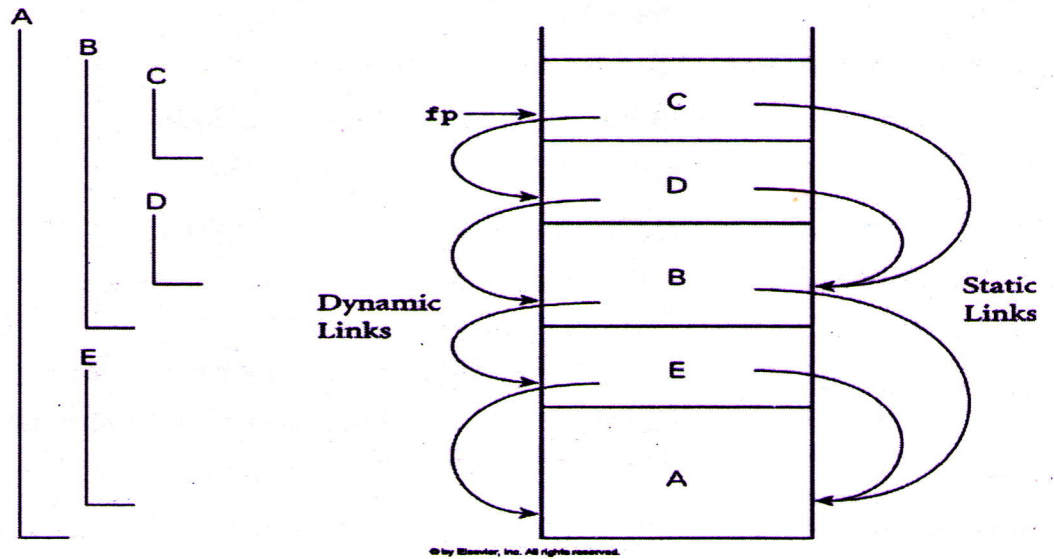
```

...
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 to be strongly typed language? (3)

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



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

13 a) 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. (6)

1) struct student

2) union student

```

{
 char name[2];
 int age;
 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).  
rainy(rochester).  
cold(rochester).  
snowy(X) :- rainy(X), cold(X). (6)

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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