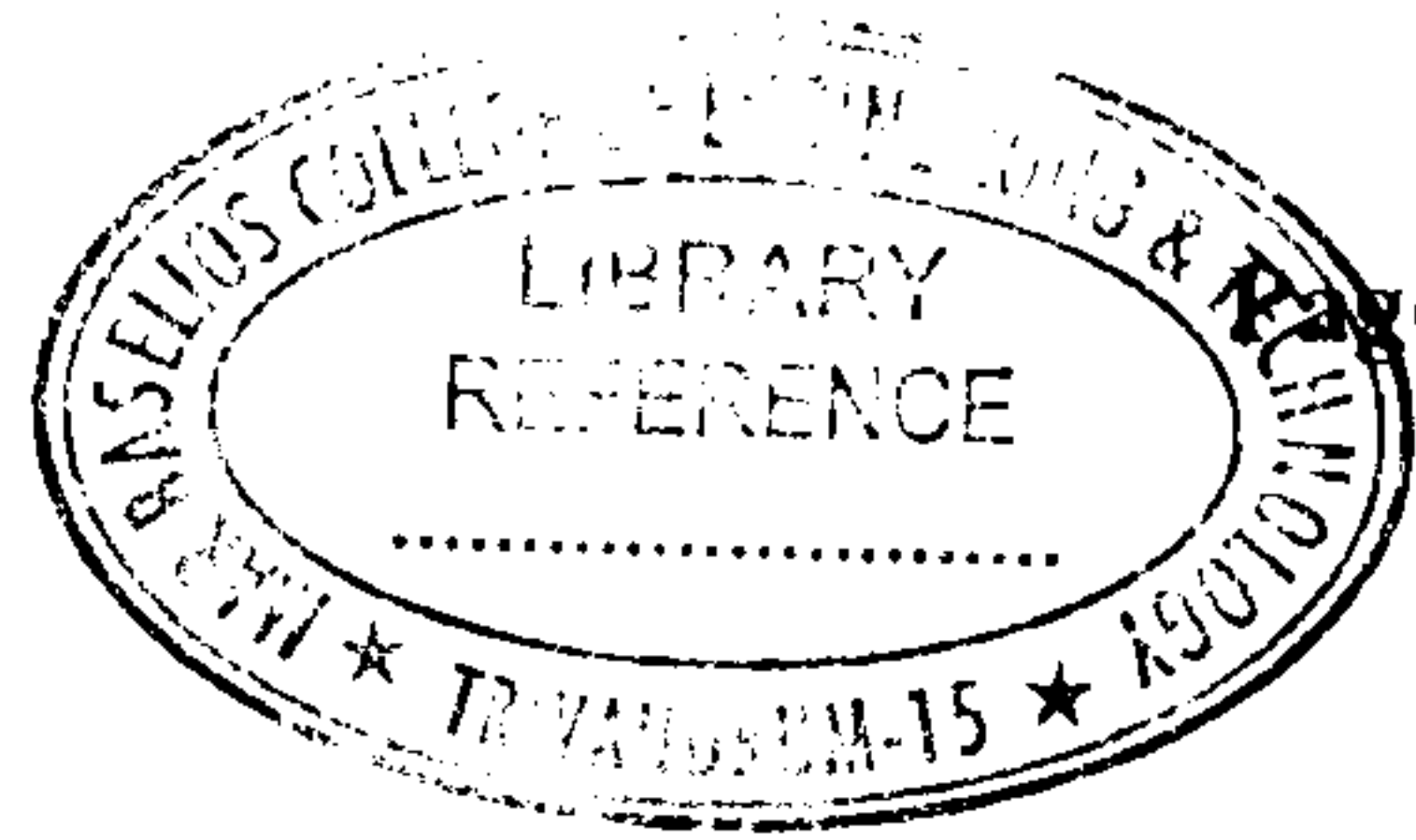


B

G1033



Pages: 4

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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 | <p>a) From the given fragment of code, identify the scope of each names used in code and also define closest nested scope rule.</p> <pre> 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); </pre> | (6) |
|----|--|-----|

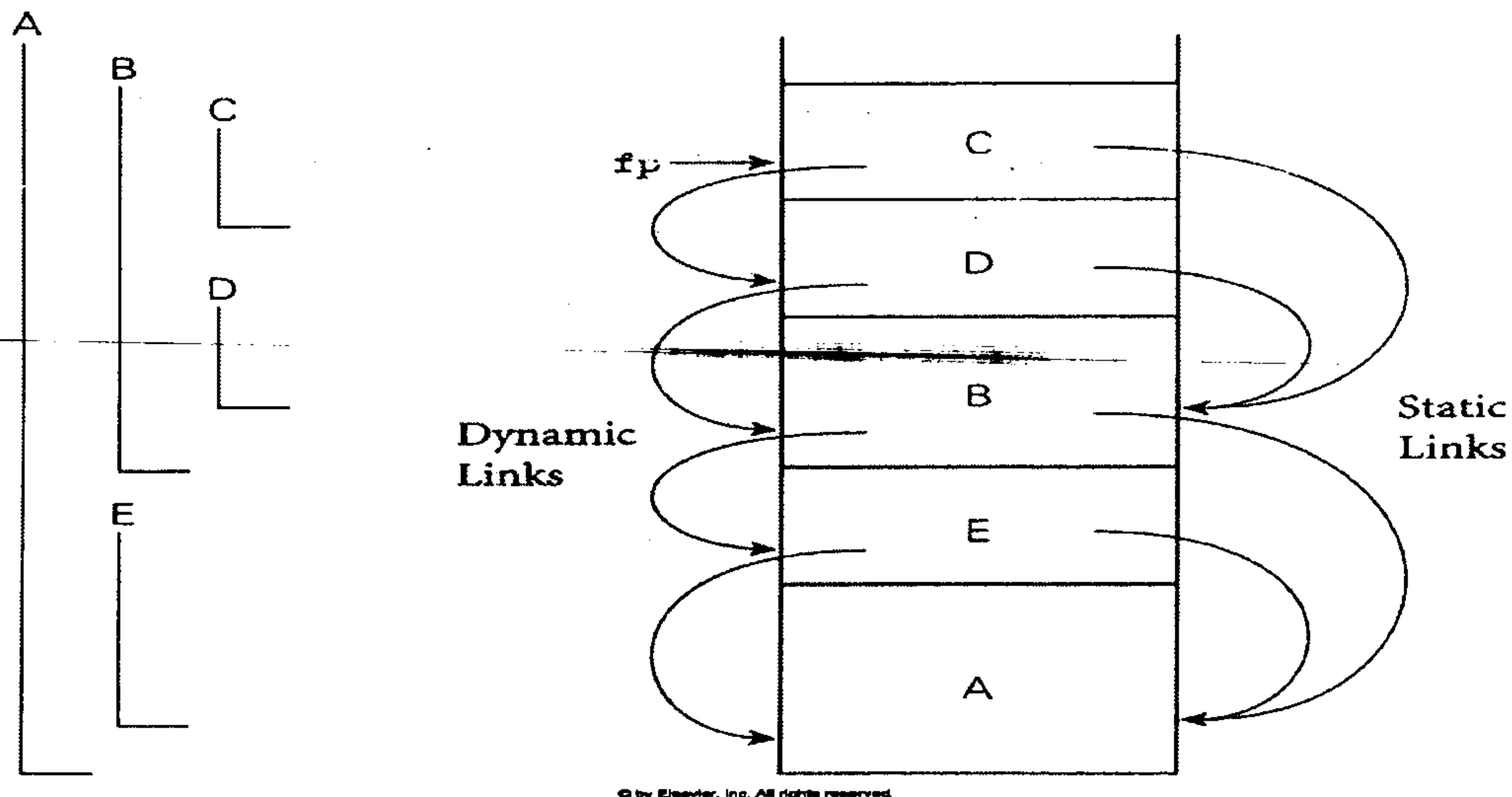
```

...
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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