

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Regular and Supplementary Examination December 2021 (2015 Scheme)

Course Code: CS403**Course Name: PROGRAMMING PARADIGMS**

Max. Marks: 100

Duration: 3 Hours

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

- | | | Marks |
|----|---|-------|
| 1 | Differentiate between static and Dynamic binding. | (4) |
| 2 | Explain the use of Frame pointer and Stack pointer in stack based allocation mechanism. | (4) |
| 3 | With the help of a figure explain memory layout of arrays. | (4) |
| 4 | Explain subroutine prologue and epilogue. | (4) |
| 5 | Evaluate the following Scheme expressions. | (4) |
| | i. (let ((x -2) (y 3))
(* x y)) | |
| | ii. (let ((x (+ -1 -6) (y 2))
(+ x y)) | |
| 6 | Explain headless Horn clauses with example. | (4) |
| 7 | Explain Class and Object in Object oriented programming. | (4) |
| 8 | Write short notes on composite data types used in scripting languages. | (4) |
| 9 | Explain how a pair of threads communicate with each other. | (4) |
| 10 | Explain how Semaphores are used to achieve synchronization. | (4) |

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

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|----|---|-----|
| 11 | a) Explain Dangling Pointer. With an example explain how a name-to-object binding can create a dangling pointer. | (4) |
| | b) Explain the various Selection statements with examples. | (5) |
| 12 | a) Consider a three dimensional array of integers (32 bit) with the following bounds.
A : array [0..5] of array [0..3] of array [0..2]
Calculate the address offset of A[1,1,1] | (5) |

- b) Explain explicit parametric polymorphism and implicit parametric polymorphism. (4)
- 13 a) What is Short-circuit expression evaluation? Point out the situations where short circuiting can be implemented. (6)
- b) Explain how pointer reversal techniques are used for garbage collection. (3)

PART C

Answer any two full questions, each carries 9 marks.

- 14 a) Explain default or optional parameters. (3)
- b) Explain the different types of parameter passing methods with examples. (6)
- 15 a) From the below facts and rules, explain the backtracking strategy in Prolog. (4)
- rainy(seattle).
rainy(rochester).
cold(rochester).
snowy(X) :- rainy(X), cold(X).
- b) Define Lambda calculus. Given the following function and expression explain applicative-order evaluation and normal order evaluation. (5)

```
(define switch (lambda (x a b c)
  (cond ((< x 0) a)
        ((= x 0) b)
        (> x 0) c))))
```

(switch -1 (+ 1 2) (+ 2 3) (+ 3 4))

- 16 a) Compare Co-routine and subroutine with examples. (6)
- b) Explain Delay and force constructs that allows to use lazy evaluation in scheme. (3)

PART D

Answer any two full questions, each carries 12 marks.

- 17 a) Explain any six object orientated concepts. (6)
- b) Explain with an example the use of 'this' parameter. (6)
- 18 a) Explain Busy-Wait synchronization. (6)
- b) Explain how synchronization can be achieved in concurrent programming. (6)
- 19 a) Which of the following patterns will exactly match the string "Paradigms" (6)
- i. / ara..[a-z]+/

- ii. /[^]gms/
- iii. /[^][A-Z][a-z]+/
- iv. /[^]P[[^]ara]+digms/
- v. /[^][A-Z][ar]*\d?[a-z]+/
- vi. /[^][a-z].+/

b) Explain how Just in Time compiler is used in Java Virtual Machine.

(6)
