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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. i. (let ((x -2) (y 3)) (* x y)) ii. (let ((x (+ -1 -6) (y 2)) (+ x y))	(4)
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.

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 complier is used in Java Virtual Machine. (6)

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