

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

**Course Code: CS403**

**Course Name: PROGRAMMING PARADIGMS**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 4 marks.*

		Marks
1	Show what is side-effect in an expression with the help of an example?	(4)
2	Can a user access a non-local object in case of subroutines, give valid reasons.	(4)
3	With example, briefly explain structural and named equivalence.	(4)
4	Describe the parameter modes used in ADA.	(4)
5	Consider the function (define double(lamda(x)(+xx))) , Evaluate the expression (double(*23)) in applicative order as well as normal order.	(4)
6	With help of an example, show how exception is handled in C++?	(4)
7	Differentiate greedy and minimal matches. Generate greedy and minimal matches for the pattern /(cd)+/ in the string accdcdcdcd	(4)
8	Explain constructors and destructors	(4)
9	What is a thread pool in Java? What purpose does it serve?	(4)
10	In what sense is fork/join more powerful than co-begin?	(4)

**PART B**

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

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|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11 | a) Write a pseudo code to find factorial of a number based on recursive and tail recursive procedure. <span style="float: right;">(4)</span><br>b) Give the code for the following source with and without short-circuit evaluation. <span style="float: right;">(5)</span><br>if( (A<=B) and (C<D) or (E!=F) ) then<br>then clause<br>else<br>else_clause |
| 12 | a) Summarize the differences among mark and sweep, stop and copy, and generational garbage collection. <span style="float: right;">(5)</span><br>b) How records are represented in programming languages? Explain. <span style="float: right;">(4)</span>                                                                                                  |
| 13 | a) Consider the following pseudocode: <span style="float: right;">(4)</span><br>x : integer := 3<br>y : integer := 4<br>procedure add<br>x := x + y<br>procedure second(P : procedure)<br>x : integer := 5<br>P()<br>procedure first<br>y : integer := 6                                                                                                   |

```
second(add)
first()
write integer(x)
```

- (a) What does this program print if the language uses static scoping? Give reasons
- (b) What does it print if the language uses dynamic scoping and give reasons
- b) What are the memory layouts used in arrays? How the address calculation is done in three dimensional arrays? (5)

### PART C

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

- 14 a) Explain co-routine? Why cactus-stack is used in co-routine? (6)
- b) In what sense do generics(template) serve a broader purpose in C++? (3)
- 15 a) Explain how to maintain the static link and dynamic link during a subroutine call. (4)
- b) (let ((a 6)  
(b 8)  
(square (lambda (x) (\* x x)))  
(plus +))  
(sqrt (plus (square a) (square b)))) (5)
- Write the output of the above code? Explain how let and lambda construct works
- 16 a) Define lazy evaluation with an example. (3)
- b) How database manipulation is carried out in Prolog using assert and retract? (3)
- c) What are the unification rules used in Prolog? (3)

### PART D

*Answer any two full questions, each carries 12 marks.*

- 17 a) Explain the innovative features of scripting languages. (9)
- b) Summarize the visibility rules used in C++. (3)
- 18 a) Compare and differentiate the data types of popular scripting languages to those of compiled languages like C. (6)
- b) What is a semaphore? What operations does it support? How binary and general semaphore does differ? (6)
- 19 a) Describe six different mechanisms(principles) commonly used to create new threads of control in a concurrent program (9)
- b) What is a JIT compiler? What are its potential advantages over interpretation/conventional compilation? (3)

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