

18/12/24

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## B.E. (FT) END SEMESTER EXAMINATIONS – NOV / DEC 2024

Computer Science and Engineering  
Fifth Semester  
**CS6302 – PROGRAMMING PARADIGMS**  
(Regulation 2018 - RUSA)

Time: 3 Hours

Answer ALL Questions

Max. Marks: 100

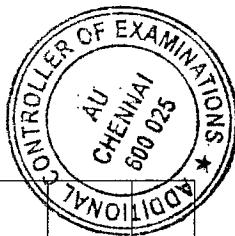
CO1	Write programs related to syntax and semantics
CO2	Compare programs between C, Perl and Small Talk
CO3	Write programs using scripting languages
CO4	Demonstrate event-driven and concurrent programming using Prolog
CO5	Apply Prolog for developing distributed systems

**PART - A (10 x 2 = 20 Marks)**

Sl.No.	Questions	Marks	CO	BL
1.	What is the principle of 'orthogonality' of programming language design?	2	CO1	L1
2.	What is 'type error'? How it can be resolved in language design?	2	CO1	L2
3.	Comment on <i>copy</i> vs <i>reference</i> semantics of assignment statements.	2	CO1	L1
4.	Give an example of an expression in C, with side effects.	2	CO2	L2
5.	What is a 'partial function'? Give example.	2	CO2	L2
6.	Illustrate the concept of implementation of dynamic arrays, using runtime stack and heap.	2	CO2	L1
7.	Mention the potential problem that occurs in the call to <i>scanf</i> function in C.	2	CO2	L2
8.	Why the semantics definition becomes complicated for multiple inheritance?	2	CO1	L2
9.	What are 'eager' and 'lazy' evaluation mechanisms?	2	CO4	L1
10.	Give expansions for the following: ALGOL, FORTRAN, LISP, PHP.	2	CO2	L1

**PART - B (8 x 8 = 64 Marks)**  
(Answer any 8 questions)

Sl.No.	Questions	Marks	CO	BL
11.	How the different programming environments execute the programs using compilation and interpretation techniques? Explain with examples.	8	CO1	L2
12.	What are the design issues for exception handling? Discuss how exceptions are handled in any popular language of your choice.	8	CO2	L1
13.	i) Present the necessary formalism for checking the validity of a typical 'function' in C-lite. ii) Consider the following C-like program:	4 4	CO2	L2



	<pre>*****  int a;  procedure foo(int x){      x = x + 10;      a = a + x;}  procedure fie( ){      a = 5;      foo(a);      print (a);}  *****</pre> <p>What is the output of the above program for each of the following parameter passing mechanisms?</p> <p>a) Argument a is passed by value  b) Argument a is passed by Reference  c) Argument a is passed by Value-Result</p>			
14.	Present the structure of an 'Activation Record'. Demonstrate the semantics of function call and return using run-time stack, for any simple recursive function of your choice.	8	CO1	L1
15.	Show all steps in the derivation of the meaning of the following assignment statement when executed in the given state, using the denotational semantic rule. $M(x=2*x+3/y-4, \{<x,6>, <y,-12>, <z,75>\})$	8	CO1	L2
16.	Describe the General features of 'Imperative programming paradigm'.	8	CO2	L1
17.	Present the detailed steps of any popular 'Garbage Collection' algorithm of your choice and critically analyze its pros and cons.	8	CO2	L1
18.	i) Mention the common characteristics of 'scripting languages'. ii) Present the distinctive features of any popular scripting language of your choice and contrast those features in terms of 'numeric types', 'arrays', 'scoping' with that of any popular compiled language.	4 4	CO3	L2
19.	Discuss about the significance of 'abstract' class in object-oriented programming, and how does it differ from an 'interface'.	8	CO2	L1
20.	What are the unique features of 'functional programming'? Demonstrate using any functional programming language of your choice the <i>list</i> data structure usage, by defining a function that accepts an unordered list and returns some ordered list.	8	CO4	L2
21.	Write short notes on two popular strategies for supporting 'synchronization' and compare their pros and cons.	8	CO3	L2
22.	What are the differentiating features of 'Event Driven programming' in comparison with 'imperative paradigm'? Present a detailed discussion on how Event handling is implemented in any popular language of your choice choosing any simple example of your choice.	8	CO4	L1

PART – C (2 x 8 = 16 Marks)

Sl.No.	Questions	Marks	CO	BL
23.	What are the distinguishing features of 'logic programming'? Solve the following query using the given facts and rules and provide illustrations wherever necessary: <i>cousin (Who, Jeff)</i> .	8	CO4	L3

	<pre>***** mother(mary, sue). mother(mary, bill). mother(sue, nancy). mother(sue, jeff). mother(jane, ron). father(john, sue). father(john, bill). father(bob, nancy). father(bob, jeff). father(bill, ron).  parent(A,B) :- father(A,B). parent(A,B) :- mother(A,B). grandparent(C,D) :- parent(C,E), parent(E,D). sibling(U,V) :- parent(P,U), parent(P,V), U\=V. cousin(X,Y) :- parent(U,X), parent(V,Y), sibling(U,V), X\=Y. *****</pre>			
24.	<p>Consider the following C-like program. What does the program print if the language uses <i>static</i> and <i>dynamic</i> scoping? Draw symbol table and explain.</p> <pre>***** Program A() {     x, y, z: integer;     procedure B()     {         y: integer;         y=0;         x=z+1;         z=y+2;     }     procedure C()     {         z: integer;         procedure D()         {             x: integer;             x = z + 1;             y = x + 1;             call B();             z = 5;             call D();         }         x = 10;         y = 11;         z = 12;         call C();         print x, y, z;     } *****</pre>	8	CO1	L3

