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Question Paper Code : 60320

M.E./M.Tech. DEGREE EXAMINATION, MAY/JUNE 2017.

Second Semester

Computer Science and Engineering

CP 7203 — PRINCIPLES OF PROGRAMMING LANGUAGES

(Common to M.Tech. Information Technology)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Identify lexemes and tokens of this statement--- value = 3 * count + 20;
2. What are the different ways to define languages?
3. State the need for scope rules.
4. What are the differences between enumeration types of C++ and Java?
5. Write down the design issues of functions.
6. What are two fundamental design considerations for parameter-passing methods?
7. What is the difference between a class variable and an instance variable?
8. When do you prefer binary semaphores over counting semaphores?
9. What does a lambda expression specify?
10. What are two ways that ML is fundamentally different from Scheme?

PART B — (5 × 13 = 65 marks)

11. (a) Discuss about the formal methods for describing syntax. (13)

Or

(b) What is parsing, what are the different types of parser available, discuss? (13)

12. (a) What are the different types of binding available, explain with an example? (13)

Or

(b) What is mixed mode and assignment statements? How it can be written in Ada and Java? (13)

13. (a) (i) Discuss on the fundamentals of Subprograms. (7)

(ii) How to implement dynamic scoping? Explain. (6)

Or

(b) Explain on the different implementation models of parameter passing? (13)

14. (a) How to implement

(i) Object Oriented Constructs (7)

(ii) Message Passing in Concurrency? (6)

Or

(b) How exception is handled in Ada? Discuss with an example. (13)

15. (a) Discuss about the basic elements of Prolog. (13)

Or

(b) Explain the fundamentals of programming languages. (13)

PART C — ($1 \times 15 = 15$ marks)

16. (a) (i) Write a grammar for the language consisting of strings that have n copies of the letter a followed by the same number of copies of the letter b, where $n > 0$. For example, the strings ab, aaaabbbb, and aaaaaaaabbbbbbbb are in the language but a, abb, ba, and aaabb are not. (8)

(ii) Draw parse trees for the sentences aabb and aaaabbbb, as derived from the grammar of Qn.No.16.(a)(i). (7)

Or

(b) Show the stack with all activation record instances, including the dynamic chain, when execution reaches position 1 in the following skeletal program. This program uses the deep-access method to implement dynamic scoping.

```
void fun1( )    {
        float a;
        ...
                }
void fun2( )    {
                int b, c;
                ...
                }
void fun3( )  {
                float d;
                ...
            }
void main( )  {
                char e, f, g;
                ...
            }
```

The calling sequence for this program for execution to reach fun3 is

main calls fun2

fun2 calls fun1

fun1 calls fun1

fun1 calls fun3 (15)
