

C 37074

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Name.....

Reg. No.....

FOURTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
JUNE 2004

IT. 2K. 404—PROGRAMMING LANGUAGE CONCEPTS

(New Scheme)

Time : Three Hours

Maximum Marks

Answer all questions.

1. (a) What is a "context-Free Grammar. Explain with an example.
(b) What is the difference between call-by-value and call-by reference methods for parameter-passing ?
(c) How do you "overload" operators in C++ ?
(d) What is "hybrid inheritance" ? Explain.
(e) What is "garbage collection" ?
(f) Explain the working of any three LISP primitive functions, with examples.
(g) Is it true that Monitors are more powerful than SEMAPHORES ? Explain your answer.
(h) What is a "rendez vous" in ADA ?
(8 × 5 = 40 marks)
2. (a) (i) Give BNF definition for the "if-then-else" construct in a typical programming language. Prove that your definition works well.
(10 marks)
(ii) Bring out the difference between "static" and "dynamic" scoping with examples.
(5 marks)

Or

(b) (i) Bring out the difference between structural equivalence and name equivalence of types with examples.
(8 marks)
(ii) Classify any seven programming languages under their "programming paradigm". Justify your answer.
(7 marks)
3. (a) (i) What is a "friend function" ? How is it useful ?
(8 marks)
(ii) Give the differences between the various "access" specifiers in C++ ?
(7 marks)

Or

(b) (i) Write a C++ class implementing the data structure "QUEUE".
(8 marks)
(ii) Test the class in part (i) by using an object of the class in the main function.
(7 marks)

Turn over

4. (a) (i) Write a LISP function that returns the number of occurrences of a given element in a given list. (8 marks)
- (ii) What is the mathematical basis for LISP ? Explain. (7 marks)

Or

- (b) (i) Write a LISP function that returns the number of non-atomic elements in the given list. (8 marks)
- (ii) Give any *three* salient features of "functional" programming. (7 marks)
5. (a) (i) Bring out the need for "unification" in a logic programming language, with an example. (10 marks)
- (ii) When do concurrent processes get "deadlocked" ? (5 marks)

Or

- (b) (i) Explain the role of the "fail" predicate in PROLOG, with a suitable example. (8 marks)
- (ii) Explain "safety" and "liveness" with respect to concurrent programs. (7 marks)

[4 × 15 = 60 marks]