

R13

Code No: 115AN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, November/December - 2018
PRINCIPLES OF PROGRAMMING LANGUAGES
(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- | | | |
|------|---|-----|
| 1.a) | Define axiomatic semantics. | [2] |
| b) | Give an attribute grammar for simple assignment statements. | [3] |
| c) | What do you mean by precision and range? | [2] |
| d) | What is aliasing? What are the problems associated with it? | [3] |
| e) | Differentiate between actual and formal parameters. | [2] |
| f) | What are the three general characteristics of subprograms? | [3] |
| g) | Define abstract data type. | [2] |
| h) | What is the purpose of a C++ destructor? | [3] |
| i) | How Haskell is different from ML? | [2] |
| j) | What is procedural abstraction? Give example. | [3] |

PART - B**(50 Marks)**

- | | | |
|-----------|--|-------|
| 2.a) | Discuss various programming domains and their associated languages. | |
| b) | Describe the basic concept of denotational semantics. | [6+4] |
| OR | | |
| 3.a) | What are the potential benefits of studying programming language concepts? | |
| b) | Explain with examples how syntactic design choices affect readability. | [5+5] |
| 4.a) | What do you mean by binding? Give examples of some of the bindings and their binding times. | |
| b) | Evaluate the two approaches for supporting dynamic allocation and deallocation for dynamic length strings. | [6+4] |
| OR | | |
| 5.a) | Explain in detail various design issues of character string types. | |
| b) | What are dangling pointers and lost heap-dynamic variables? How are they created? | [4+6] |
| 6.a) | How co-routines are different from conventional subprograms? | |
| b) | Explain type checking technique in parameter passing. | [5+5] |
| OR | | |
| 7.a) | What is a subprogram? Discuss the design issues of subprograms. | |
| b) | Write a detailed note on local referencing environments. | [5+5] |

- 8.a) What are the various methods of exception handling? Discuss.
b) How message passing is implemented in ADA? Give examples. [5+5]

OR

- 9.a) Explain how information hiding is provided in an ADA package.
b) Discuss about the basic elements of Prolog with examples. [5+5]

- 10.a) Explain the important functions of LISP.
b) Discuss the key concepts of scripting languages. [5+5]

OR

- 11.a) What are the three features of Haskell that makes very different from schema?
b) What are the data types supported in Python? Discuss. [5+5]

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PART - A**(25 Marks)**

- 1.a) List the principal phases of compilation. [2]
- b) Explain the features of denotational semantics. [3]
- c) Explain about guarded commands. [2]
- d) Differentiate between user defined and primitive data types with an example. [3]
- e) Explain about the local referencing environments. [2]
- f) Explain the design issues for functions. [3]
- g) Explain the parts of smalltalk class. [2]
- h) Distinguish between Competitive Synchronization and Cooperation synchronization. [3]
- i) What is the type inferencing used in ML. [2]
- j) What are the applications of functional programming languages. [3]

PART - B**(50 Marks)**

- 2.a) Distinguish between ambiguous grammar and attribute grammar with an example.
- b) Construct the parse tree for the simple statement. [5+5]
$$A := B * (A + C)$$

OR

- 3.a) Explain about the preconditions and postconditions of a given statement mean in axiomatic semantics.
- b) Describe the important factors influencing the writability of a language. [5+5]
- 4.a) Describe about the pointers in FORTRAN 90, Ada, pascal with an example.
- b) Write the syntax and semantic rule of an attribute grammar for simple assignment statements. [5+5]

OR

- 5.a) Explain about the control structures with an example.
- b) Explain the different types of Union with an example. [5+5]
6. Explain the different parameter passing methods with an example. [10]

OR

- 7.a) What is an overloaded subprogram explain with an example.
- b) What are the characteristics of co-routine feature? List the languages which allow coroutines. [5+5]

- 8.a) What is semaphore. Explain the different types of semaphores.
b) Explain the design issues of an exception handling system. [5+5]

OR

- 9.a) Explain about the data abstraction for SIMULA 67.
b) Explain how to handle the exceptions in C++. [5+5]

- 10.a) Write a function that computes the sum of numbers using vectors in LISP.
b) Explain the different types of data types used in Python. [5+5]

OR

- 11.a) Explain how to handle exceptions in Java with an example.
b) Explain about the fundamentals of functional programming languages. [5+5]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

**B.Tech III Year I Semester Examinations, May/June - 2019 PRINCIPLES
OF PROGRAMMING LANGUAGES**

(Computer Science and Engineering)

Time: 3 hours

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PART - A

(25 Marks)

- 1.a) Explain about the Virtual Machine. [2]
- b) What are the uses of attribute grammar? [3]
- c) Explain about the problems in unconditional branching. [2]
- d) Explain about the enumerated data type. [3]
- e) What are the characteristics of subprograms? [2]
- f) Explain about coroutines. [3]
- g) Why does Java not have a destructors? [2]
- h) What are the applications of logic programming? [3]
- i) Describe the scoping rule in ML. [2]
- j) Explain about the fundamentals of FPL. [3]

PART - B

(50 Marks)

- 2.a) Explain about the preconditions and postconditions of a given statement mean in axiomatic semantics.
 - b) Describe the steps involved in the language evaluation criteria. [5+5]
- OR**
- 3.a) Explain the different categories of languages.
 - b) Draw and explain the flow chart for compilation process. [5+5]
- 4.a) Explain about the mixed-mode assignments that are used in Ada and Java Languages.
 - b) Explain about the type compatibility with an example. [5+5]
- OR**
- 5 a) What is type checking? Differentiate between static and dynamic type checking and give their relative advantages.
 - b) Define an array? Explain how to initialize an array? Explain the different types of arrays. [5+5]

- 6.a) Describe about the static and dynamic scope of variables with an example.
b) Define sub program. What are the distinct categories of subprograms. [5+5]

OR

- 7.a) Explain about the generic subprograms in Ada with an example.
b) Explain about the semantic models of parameter passing. [5+5]

- 8.a) Explain about the concurrency in Ada 95.
b) Explain the basic elements of prolog. [5+5]

OR

- 9.a) Explain how to handle the exceptions in Ada.
b) What are the design issues of abstract data types. [5+5]

- 10.a) Explain about the internal representation of two LISP lists.
b) Describe the scoping rule in common LISP and Haskell. [5+5]

OR

- 11.a) Compare the functional programming languages with imperative languages.
b) Write a LISP function Fib(n) that computes nth Fibonacci number. [5+5]

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