PAPER ID-410962

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Subject Code: RCS503

Roll No: | | | | | | | | | | | | | |

B.TECH
(SEM V) THEORY EXAMINATION 2021-22
PRINCIPLE OF PROGRAMMING LANGUAGES

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION- A

1. Attempt *all* questions in brief: **2X7=14**

a. When and why dynamic type checking and static type checking operation are performed?
b. Write down the different attributes of a good programming language.
c. Write down the semantics of simple call and return subprogram.
d. Draw a DFA for the language accepting strings ending with '01' over input alphabets $\sum = \{0, 1\}$.
e. Write a regular expression for a language containing binary strings whose decimal representation is divisible by 5.
f. Write down the different properties of a constructor in Java.
g. Differentiate between structure and union.

SECTION-B

2. Note: Attempt any *three parts* of the following: **7X3=21**

a. Explain the structure or phases of compiler with the help of block diagram.
b. Discuss the various formal translation models in detail.
c. What is semaphore? Explain the different types of it with the help of an example.
d. Write down the various features of an object oriented programming language. Discuss the basic object oriented concepts in detail.
e. What are the various fields of an activation record? Explain how activation record looks like for every recursive call in case of factorial.

SECTION-C

3. Attempt any *one* part of the following: **7X1=7**

(a) What is lambda calculus? Write a short note on free and bound variables in lambda calculus. Discuss B-reduction with the help of an example.
(b) What is an exception? List its various types and explain exception handling in Java with the help of suitable example.

4. Attempt any *one* part of the following: **7X1=7**

(a) Describe subprogram control and its types in detail with the help of an example of each of them.
(b) What is functional programming language? Write down the various features and applications of a functional programming language.

5. Attempt any *one* part of the following **7X1=7**

(a) Differentiate between call by value and call by reference parameter passing mechanism with the help of suitable example.
(b) Discuss the concept of monitor. How a monitor differs from semaphore?

6. Attempt any *one* part of the following: **7X1=7**

(a) Explain the different types of statements with their syntax and examples of each of them.
(b) Differentiate between method overloading and operator overloading. Write a program in Java for method overloading.

7. Attempt any *one* part of the following: **7X1=7**

(a) What is the purpose of predicate calculus? How it helps in theorem proving?
(b) Discuss the significance of list structures and Goal statements in PROLOG.

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