

B.Tech. Degree III Semester Regular/Supplementary Examination January 2023

CS 19-202-0305 PRINCIPLES OF PROGRAMMING LANGUAGES (2019 Scheme)

Time: 3 Hours

Maximum Marks: 60

Course Outcomes

On successful completion of the course, the students will be able to:

- CO1: Summarize the evaluation criteria for programming languages.
 CO2: Familiarise notations to describe syntax and semantics of programming languages.
 CO3: Compare different programming paradigms – imperative, object oriented, functional and logical programming and choose the appropriate one for problem solving.
 CO4: Analyze and explain behavior of imperative languages using concepts like binding, scope and lifetime, referencing environment, subprograms and parameter passing mechanisms.
 CO5: Explain the concepts of object oriented, functional and logic programming for solving problems.
 CO6: Explain the design issues involved in various constructs of programming languages.
 Bloom's Taxonomy Levels (BL): L1 – Remember, L2 – Understand, L3 – Apply, L4 – Analyze, L5 – Evaluate, L6 – Create
 PO – Programme Outcome

PART A

(Answer ALL questions)

| | | (8 × 3 = 24) | Marks | BL | CO | PO |
|----|--|--------------|-------|----|----|-----|
| I. | (a) Many languages distinguish between uppercase and lowercase letters in user-defined names. What are the pros and cons of this design decision? | | 3 | L4 | 1 | 1,2 |
| | (b) Consider the following grammar: $\begin{aligned} \langle S \rangle &\rightarrow a \langle S \rangle c \langle B \rangle \mid \langle A \rangle \mid b \\ \langle A \rangle &\rightarrow c \langle A \rangle \mid c \\ \langle B \rangle &\rightarrow d \mid \langle A \rangle \end{aligned}$ Write any three sentences that can be generated by this grammar. ✓ | | 3 | L3 | 2 | 1,2 |
| | (c) Explain the working of coroutines with suitable diagram. ✓ | | 3 | L2 | 4 | 1,2 |
| | (d) Discuss about named constants with suitable example. | | 3 | L2 | 4 | 1,2 |
| | (e) Describe the design issues for Object-Oriented Languages. | | 3 | L2 | 6 | 1,2 |
| | (f) Explain exception handling with suitable example. ✓ | | 3 | L2 | 5 | 1,2 |
| | (g) What are the differences between imperative and functional languages? | | 3 | L3 | 5 | 1,2 |
| | (h) Briefly explain the deficiencies of Prolog. | | 3 | L2 | 6 | 1,2 |

PART B

(4 × 12 = 48)

| | | | | | | |
|------|-------|--|---|----|---|-----|
| II. | (a) | Explain any six characteristics that influence the language evaluation criteria <u>writability</u> during development of a new language. | 6 | L2 | 1 | 1,2 |
| | (b) | Compare and contrast Context Free Grammar and Backus Naur Form. ^{also 60} | 6 | L2 | 2 | 1,2 |
| OR | | | | | | |
| III. | (a) | Explain any six characteristics that influence the language evaluation criteria Reliability during development of a new language. | 6 | L1 | 1 | 1,2 |
| | (b) | Explain the following with suitable examples: | 6 | L2 | 2 | 1,2 |
| | (i) | Synthesized attributes | | | | |
| | (ii) | Inherited attributes | | | | |
| | (iii) | S-attributed SDT | | | | |
| | (iv) | L-attributed SDT | | | | |