

B Tech V Semester Back Paper Examination - 2016

TCS504 -Principle of Programming Languages

Time: 3 Hours

Total Marks: 100

- Note: (i) Attempt **ALL** questions all Questions carry equal marks.
(ii) In case of numerical problems assume data wherever not provided.
(iii) Be precise in your answer.

1. Attempt **any four** parts of the following: (5 × 4 = 20)
 - (a) What is a programming language? Explain the importance of programming language.
 - (b) What are the major factors that affect development and evolution of programming language methodologies?
 - (c) Define virtual computer.
 - (d) What is syntax in programming language?
 - (e) What do you mean by translator? Explain its structure and operation.

2. Attempt **any four** parts of the following: (5 × 4 = 20)
 - (a) What are co-routines? Discuss their implementation?
 - (b) Discuss Recursive subprogram implementation?
 - (c) Write a program for computing factorial n(n!). Elaborate the suitability of sequence control used by you .
 - (d) Explain in detail encapsulation, information hiding and abstraction.
 - (e) Explain exception handling by taking a suitable example?

3. Attempt **any two** parts of the following: (10 × 2 = 20)
 - (a) Write short notes on:
 - i) Call by value method of parameter passing.
 - ii) Call by reference method of parameter passing.
 - (b) Explain the following:
 - i) Static storage management.
 - ii) Heap-based storage management
 - iii) Stack – based storage management
 - (c) What is heap? Explain how heap can be used to implement storage management. In this context explain the most suitable data structure to implement heap such that garbage collection and removal of dangling references is carried out effectively.

4. Attempt **any two** parts of the following: (10 × 2 = 20)
 - (a) (i) What are syntactic elements? Explain with example.
(ii) What is syntax in programming language?
 - (b) Compare the orthogonality of Pascal and FORTRAN.
 - (c) What is Object Oriented Programming? Compare the object description of C++ and Java.

5. Attempt **any two** parts of the following: (10 × 2 = 20)
 - (a) Define the following terms:
 - i) Implicit and Explicit sequence control
 - ii) Referencing environment
 - (b) Explain in detail encapsulation, information hiding and abstraction.
 - (c) What do you mean by Context Free Grammar? Consider the following context free grammar:
S → AB / BC
A → BA / a
B → CC / b

$C \rightarrow AB/a$

Draw the derivation tree and write leftmost derivation for the following string: baaba?