Exam Code: 0917
Sub. Code: 6404

2063
B.E. (Computer Science and Engineering)
Fifth Semester
CS-504: Principles of Programming Languages

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Section.

x-x-x

1. (a) Briefly enumerate the use of Garbage Collection.
   (b) What do you understand by Binding?
   (c) What is independent compilation?
   (d) Define Higher Order Functions using a suitable example.
   (e) Why is there no assignment operation in pure functional programming? **(5x2=10)**

Section-A

2. Consider following BNF grammar. The start symbol is <Pedigree>
   <Pedigree>→ <Name>
   <Pedigree>→ <Name><Parents>
   <Parents> → <Person><Person>
   <Person> → () | (<Pedigree>)
   <Name> → <Letter> | <Letter><Name>
   <Letter> → A | ... | Z | a | ... | z
   For each of the following, indicate whether the string belongs to the language recognized by this grammar or not and if it does belong to the language, give a derivation:
   (a) Charles ()
   (b) Charles (Elizabeth)
   (c) Charles (() Philipp)
   (d) Charles () (Philipp)
   (e) Charles (Elizabeth) (Philipp) **(5x2)**

3. Explain abstraction and encapsulation with the help of suitable example. How can a method be overridable in JAVA and C++? **(10)**
4. (a) Explain in detail different stages in language translation. **(5)**
   (b) What are the various synchronization primitives in concurrent programming? Discuss in detail. **(5)**

P.T.O.

Section-B

5. Differentiate between Static storage management and Heap based storage management. **(10)**

6. (a) Explain different Polymorphic data types with the help of suitable examples. **(5)**
   (b) Explain the rules for expression evaluation in functional programming. **(5)**
7. (a) Explain Procedural, Generic and Data abstraction in C++. **(5)**
   (b) Write the different classes of exceptions in java. **(5)**

x-x-x