[4959] - 1170B
B.E. (Computer Engineering) (Semester - II)
Programming Paradigms for Complex Problems - Case Studies in Python
(Open Elective) (2012 Pattern)

Time : 2 ½ Hours]   *[Max. Marks : 70*

Instructions to the candidates:
1) *Attempt questions Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8 and Q.9 or Q.10.*
2) *Assume suitable data, if necessary.*
3) *Neat diagrams must be drawn whenever necessary.*

Q1) a) Describe the following approaches of expression evaluation with respect to functional programming languages.   **[6]**

   i)   Innermost evaluation.

   ii) Selective evaluation.

   iii) Outermost evaluation.

b) Create a dictionary named member_table that contains user's email address as keys, and their current password as values. Write a function that generates a temporary new password for a given user and updates it in the table.   **[4]**

OR

Q2) a) Explain the following list functions with suitable examples: **[4]**

   i)   append.

   ii) count.

   iii) insert.

   iv) pop.

P.T.O.

b) Find output of following GOFER statements and comment on feature of functional programming covered in the statement. **[6]**

 i) add.(x,y)=x+y

   inc.(y)=add.(1,y)

   ? inc.2

 ii) ? len.[1/0,4,5]

 iii) f = \x-> x + 1

   g = \x-> x–1

   ? f.3

   ? g.3

   ? f.(g.3)

Q3) a) Differentiate between following programming paradigm **[6]**

 i) Functional and Declarative.

 ii) Functional and Object oriented.

 iii) Imperative and Declarative.

b) Write a python program to arrange string in alphabetical order. **[4]**

<center>OR</center>

Q4) a) Differentiate between essential state and incidental state of object. **[4]**

b) What do you mean by type inference? Consider functional composition, defined by the equation (.) f g x = f (g x) **[6]**

describe the process of type inference with the help of

 i) Application rule.

 ii) Equality rule.

 iii) Functional rule.

Q5) a) Give a recursive definition of binomial coefficients. Write a python program for selecting 'p' players from 'n' players. **[6]**

b) What is recursive data structure? Explain any three recursive data structure. **[8]**

c) Write a recursive python program for Reversing a list. **[4]**

<div align="center">OR</div>

Q6) a) Write a python program for generating and traversing a binary tree. **[8]**

b) Write a program to find length of a string. **[4]**

c) With suitable example, Explain the concept of recursion at TAIL. **[6]**

Q7) a) Write a Python program to maintain reservations for vehicle rental agency. The Agency rents out three types of vehicles namely cars, vans and moving trucks. The program should allow user to check for available vehicle, request rental charges by vehicle type, get the cost, of renting a particular type vehicle for specified period of time, and make reservations. **[8]**

b) With the help of suitable example, Explain the concept of Decorator and Generator of python. **[8]**

<div align="center">OR</div>

Q8) a) Write a python class named 'FRACTION' consisting of two private variable namely numerator and denominator. Write a program using operator overloading for following operations on fraction numbers. **[8]**
   i)   Addition.
   ii) Subtraction.
   iii) Multiplication.
   iv) Negation.

b) With suitable examples, write short notes on following object oriented concepts using python. **[8]**
   i)   Adding attributes dynamically.
   ii) Data hiding.
   iii) Constructor.
   iv) Inheritance.

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Q9) a) Explain following statement with respect to importing packages to application programs. **[6]**

      i)   from package import item.

      ii)   import item.subitem.subitem.

      iii)   from package.subpackage import*.

  b) Write short note on Virtual environment and version control in python. **[6]**

  c) How is the reload function related to import works? **[4]**

<div align="center">OR</div>

Q10) a) Where does python look for files to import? **[8]**

  b) Write equivalent statements of "from module import name1, name2". **[4]**

  c) What is use of packages? **[4]**

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