Chettinad College of Engineering & Technology
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Question Bank

Year/Semester: I/ I Date: / /2024	Department: CSE Subject Code/Title :GE3151 -Problem Solving And Python Programming Faculty Name:Mrs.C.Sangeetha	Unit:I/II/III/IV/ V Section: Part A/B/C

UNIT I

Part A

1. **Write an algorithm to accept two numbers compute the sum and print the result.**
   Step 1: Start.
   Step 2: Read A, B.
   Step 3: Sum=A+B.
   Step 4: Print Sum.
   Step 5: Stop.
2. **Define an iterative statement.**
   Iteration is the repetition of a process in a computer program, usually done with the help of loops. Many computer programs and programming languages use iterations to perform specific tasks, solve problems, and present solutions.
3. **Write an algorithm to find the smallest among three numbers.**
   1) Step 1: Start
   2) Step 2: Read three numbers in variable a, b and c.
   3) Step 3: If a<b and a<c then display “a is the smallest number"
   If b<a and b<c then display “b is the smallest number"
   If c<a and c<b then display “c is the smallest number"
   4) Step 4: Stop
4. **What is a recursion?**
   Recursion is a method of solving problems that involves breaking a problem down into smaller and smaller subproblems until you get to a small enough problem that it can be solved trivially. Usually recursion involves a function calling itself. While it may not seem like much on the surface, recursion allows us to write elegant solutions to problems that may otherwise be very difficult to program.
5. **What are the factors used to judge the quality of the algorithms?**
   - Time To execute a program if the lesser time is required then it is the better one.
   - Memory To execute a program if the lesser memory is required then it is the better.
   - Accuracy Multiple algorithms may provide suitable or correct solutions to a given problem, some of these may provide more accurate results than others, and such algorithms may be suitable**.**
6. **What is control flow? List and define the ways of execution of control.**
   The process of executing the individual statements in a given order is called control flow. The control can be executed in three ways; a) Sequence, b) Selection & c) Iteration.
   a) Sequence: All the instructions are executed one after another is called sequence of execution.
   b) Selection: A selection statement causes the program control to be transferred to a specific part of the program based upon the condition. If the conditional test is true, one part of the program will be executed, otherwise it will execute the other part of the program.
   c) Iteration: In some programs, certain set of statements are executed again and again based

upon conditional test. i.e. executed more than one time. This type of execution is called looping or iteration

7. **What is an algorithm?**
   Algorithm is a step-by-step procedure, which defines a set of instructions to be executed in a certain order to get the desired output. Algorithms are generally created independent of underlying languages
8. **Distinguish algorithm and program**
   An algorithm is a step-by-step procedure for solving the problem, while programming is a set of instructions for a computer to follow to perform a task. A program could also be an implementation of code to instruct a computer on how to execute an algorithm.

9. **Differentiate top tested and bottom tested loops.**

- Loops with the test at the top of the loop (while and for loops) are called top-driven loops.
- Loops implemented with the test at the bottom (a do loop) are called bottom-driven loops.

10. **What is Towers of Hanoi Problem?**
    The mission is to move all the disks to some another tower without violating the sequence of arrangement. A few rules to be followed for tower of Hanoi are
    Rules
    - Only one disk can be moved among the towers at any given time
    - Only the top disk can be removed
    - No large disk can sit over a small disk
11. **List the building blocks of the algorithm.**
    - **Statement**
    - **State**
    - **Control Flow -** a) Sequence, b) Selection & c) Iteration
    - **Functions**
12. **Define function. List its benefits.**
    Function is a sub program which consists of set of instructions or code that performs a particular task. For complex problems, the problem is been divided into smaller and simpler tasks during algorithm design.
    Benefits of Using Functions
    - Reduction in line of code
    - Reuse the code
    - Better readability
    - Information hiding
    - Improved maintainability
    - Easy to debug and test
13. **What are the rules for writing pseudocode?**
    - Write one statement per line
    - Capitalize initial keyword
    - Indent to hierarchy
    - End multiline structure
    - Keep statements language independent
14. **List the properties of algorithm.**
    - Algorithm should be written in simple English
    - Each and every instruction should be accurate and explicit
    - Instructions in an algorithm should not be repeated infinitely.
    - Algorithm should conclude after a finite number of steps.
    - Should have an end point
    - Derived results should be obtained only after the algorithm terminates.
15. **List the advantages of flowchart**
    1. Easy Communication

2. Effective analysis
3. Efficient Coding
4. Efficient Program Maintenance
5. Documentation
6. Debugging

16. list Disadvantages of flow chart

1. Complex logic: - Sometimes, the program logic is quite complicated. In that case, flowchart becomes complex and uncoordinated.
2. Alterations and Modifications: - If alterations are required the flowchart may require re-drawing completely.
3. Reproduction: - As the flowchart symbols cannot be typed, reproduction of flowchart becomes a problem.
4. Cost: For large application the time and cost of flowchart drawing becomes costly.

17. What is pseudocode?

Pseudo code consists of short, readable and English languages used by an algorithm.
It does not include details like variable declaration, subroutines.
It is easier for the programmer or non programmer to understand the general working of the program, because it is not based on any programming language.
It gives us the sketch of the program before actual coding.
It is not a machine readable
There is no standard syntax for pseudo code. It is program design language.

18. Define programming language.

A programming language is a set of symbols and rules for instructing a computer to perform specific tasks. The programmers have to follow all the specified rules before writing program using programming language. The user has to communicate with the computer using language which it can understand. Types of programming language 1. Machine language 2. Assembly language 3. High level language

19. List the Advantages and Disadvantages of Pseudocode

Advantages
Pseudo is independent of any language; it can be used by most programmers.
It is easy to translate pseudo code into a programming language.
It can be easily modified as compared to flowchart.
Converting a pseudo code to programming language is very easy as compared with converting a flowchart to programming language.

Disadvantages
It does not provide visual representation of the progrogic.
There are no accepted standards for writing pseudo codes.
It cannot be compiled nor executed.
For a beginner, it is more difficult to follow the logic or write pseudo code as compared to flowchart.

20. What is Tower of Hanoi?

The Tower of Hanoi is a mathematical game or puzzle consisting of three rods and a number of disks of various diameters, which can slide onto any rod. The puzzle begins with the disks stacked on one rod in order of decreasing size, the smallest at the top, thus approximating a conical shape. The objective of the puzzle is to move the entire stack to the last rod, obeying the following rules:

Only one disk may be moved at a time.
Each move consists of taking the upper disk from one of the stacks and placing it on top of another stack or on an empty rod.
No disk may be placed on top of a disk that is smaller than it.

16 marks & 8 marks

1. Draw a flowchart to find the sum of the series
   1 + 2 + 3 +…….+100
2. State the Towers of Hanoi problem. Outline the solution to the problem using relevant diagrams.
3. Write a recursive algorithm to find the factorial of a given number.
4. Explain building blocks of the algorithm
5. Differentiate iterative and recursive strategies for developing algorithm.
6. Identify the simple strategies /problem solving strategies for developing an algorithm
7. Write an algorithm, flowchart and pseudo code to insert a card into a list of sorted cards.
8. Write algorithm and flowchart to
   - find GCD
   - find a number is odd or even
   - to generate Fibonacci series
   - Area of triangle, area and circumference of circle
   - Roots of quadratic equation
   - Find Armstrong Number or not
   - Find the sum of digits of a number
   - Find reverse of a number
   - Sum of odd integers between 1 and n.
   - Find minimum and Maximum in the list
   - Guess the number in the range
9. What is pseudocode? Explain how it can be developed. Write its benefits and limitations.
10. What is a Flowchart? What are the tools used to develop the flowchart. Explain the structures used in flowcharts.
11. Compare machine level language, assembly language and high level language.

UNIT II
Part A

1. **Are comments are executable statements in a python program? How comments are included in python program?**
   Comments in Python are non-executable statements. It means neither the Python compiler nor the PVM (Python Virtual Machine) will execute them. Comments are intended for human understanding, not for the compiler or PVM. Therefore they are called non-executable statements.
   the # character is used to start a comment. The comment continues after the # until the end of the line.
   Eg; print("Hello, World!") #This is a comment

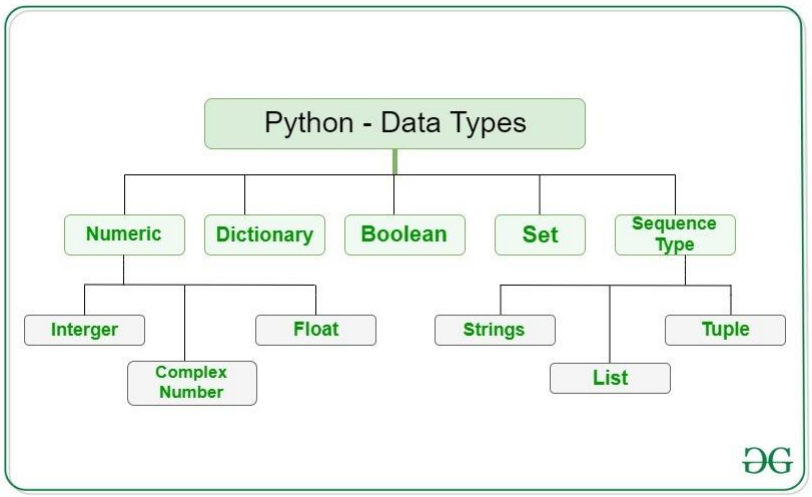
2. **Define Python.**
   Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. It was invented by Guido van Rossum in 1991.

3. **What are the modes of the python interpreter?**
   Python has two basic modes: script and interactive. The normal mode is the mode where the scripted and finished . py files are run in the Python interpreter. Interactive mode is a command line shell which gives immediate feedback for each statement, while running previously fed statements in active memory.
4. **Difference between compiler and interpreter.**

Compiler	Interpreter
• A compiler takes the entire program in one go.	• An interpreter takes a single line of code at a time.
• The compiler generates an intermediate machine code.	• The interpreter never produces any intermediate machine code.
• The compiler is best suited for the production environment.	• An interpreter is best suited for a software development environment.
• The compiler is used by programming languages such as C, C ++, C #, Scala, Java, etc.	• An interpreter is used by programming languages such as Python, PHP, Perl, Ruby, etc.

5. **List the scalar data types in python.**
   Python comes with a number of built-in data types. These include primitive scalar types like integers as well as collection types like dictionaries. These built-in types are powerful enough to be used alone for many programming needs, and they can be used as building blocks for creating more complex data types.
   int ,float ,None ,bool

6. **What are the different types of data types?**



7. **What is meant by interpreter?**
   An interpreter is a computer program that executes instructions written in a programming language. It can either execute the source code directly or translate the source code in a first step into a more efficient representation and executes this code.
8. **What is meant by interactive mode of the interpreter?**
   Interactive mode is a command line shell which gives immediate feedback for each statement, while running previously fed statements in active memory. As new lines are fed into the interpreter, the fed program is evaluated both in part and in whole.
9. **What is a value? What are the different types of values?**

A value is one of the fundamental things – like a letter or a number – that a program manipulates. Its types are: integer, float, boolean, strings and lists.

10. **Define a variable and write down the rules for naming a variable.**

A name that refers to a value is a variable. Variable names can be arbitrarily long. They can contain both letters and numbers, but they have to begin with a letter. It is legal to use uppercase letters, but it is good to begin variable names with a lowercase letter.

11. **Define keyword and enumerate some of the keywords in Python.**
    A keyword is a reserved word that is used by the compiler to parse a program. Keywords

cannot be used as variable names. Some of the keywords used in python are: and, del, from, not, while, is, continue.

12.Define statement and what are its types?

A statement is an instruction that the Python interpreter can execute. There are two types of statements: print and assignment statement.

13.What do you meant by an assignment statement?

An assignment statement creates new variables and gives them values:

Eg 1: Message = 'And now for something completely different'

Eg 2: n = 17

14. What is tuple?

A tuple is a sequence of immutable Python objects. Tuples are sequences, like lists. The differences between tuples and lists are, the tuples cannot be changed unlike lists and tuples use parentheses, whereas lists use square brackets. Creating a tuple is as simple as putting different comma-separated values. Comma-separated values between parentheses can also be used.

Example: tup1 = ('physics', 'chemistry', 1997, 2000);

11.What is an expression?

An expression is a combination of values, variables, and operators. An expression is evaluated using assignment operator.

Examples: Y=x + 17

12. What do you mean by an operand and an operator? Illustrate your answer with relevant example.

An operator is a symbol that specifies an operation to be performed on the operands. The data items that an operator acts upon are called operands. The operators +, -, *, / and ** perform addition, subtraction, multiplication, division and exponentiation.

Example: 20+32

In this example, 20 and 32 are operands and + is an operator.

13. What is the order in which operations are evaluated? Give the order of precedence.

The set of rules that govern the order in which expressions involving multiple operators and operands are evaluated is known as rule of precedence. Parentheses have the highest precedence followed by exponentiation. Multiplication and division have the next highest precedence followed by addition and subtraction.

14. Illustrate the use of * and + operators in string with example.

The * operator performs repetition on strings and the + operator performs concatenation on strings.

Example:

>>> ‘Hello*3’

Output: HelloHelloHello

>>>’Hello+World’

Output: HelloWorld

15. What is the symbol for comment? Give an example.

is the symbol for comments in Python.

Example:

compute the percentage of the hour that has elapsed

16. What is function call?

A function is a named sequence of statements that performs a computation. When we define a function, we specify the name and the sequence of statements. Later, we can “call” the function by its name called as function call.

17. Identify the parts of a function in the given example.
>>> betty = type("32")
>>> print betty
The name of the function is type, and it displays the type of a value or variable. The value or variable,which is called the argument of the function, is enclosed in parentheses. The argument is 32. The function returns the result called return value. The return value is stored in betty.

18. What is a local variable?
A variable defined inside a function. A local variable can only be used inside its function.

19. What is the output of the following?
a. float(32)
b. float("3.14159")
Output:
a. 32.0 The float function converts integers to floating-point numbers.
b. 3.14159 The float function converts strings to floating-point numbers.

20. What do you mean by flow of execution?
In order to ensure that a function is defined before its first use, we have to know the order in which statements are executed, which is called the flow of execution. Execution always begins at the first statement of the program. Statements are executed one at a time, in order from top to bottom.
17. Write down the output for the following program.
first = 'throat'
second = 'warbler'
print first + second
Output:
throatwarbler
18. Give the syntax of function definition.
def NAME(LIST OF PARAMETERS):
    STATEMENTS
19. Explain the concept of floor division.
The operation that divides two numbers and chops off the fraction part is known as floor division.
20. What is type conversion? Give example.
Automatic method to convert between data types is called type conversion. For mathematical operators, if any one operand is a float, the other is automatically converted to float.
Eg:
>>> minute = 59
>>> minute / 60.0
0.983333333333

21. Write a math function to perform √2 / 2.
>>> math.sqrt(2) / 2.0
0.707106781187
22. What is meant by traceback?
A list of the functions that tells us what program file the error occurred in, and what line, and what functions were executing at the time. It also shows the line of code that caused the error.
23. What are Numeric Literals in Python?
In Python, a numeric literal is a notation representing a fixed numeric value in the code. Python has three types of numeric literals: integer literals, floating-point literals, and complex literals.

Part B & C (16 marks & 8 marks)

1. Discuss about Python interpreter and interactive mode
2. Explain about different data types in python with examples.
3. Discuss about types of operators and precedence of operators with example
4. Write a python program to exchange the values of two variables (with or without temporary variable)
5. Write a python program to circulate the values of n variables
6. Write a python program to find distance between two points.
7. Discuss about variable, keywords, expression in detail wit example.

UNIT III
Part A

1. **Define a recursive function**
   The process in which a function calls itself directly or indirectly is called recursion and the corresponding function is called as recursive function.
2. **Present the flow of execution for while statement.**
   While loop statement in Python is used to repeatedly executes set of statement as long as a given condition is true.
   In while loop, test expression is checked first. The body of the loop is entered only if the test_expression is True. After one iteration, the test expression is checked again. This process continues until the test_expression evaluates to False. In Python, the body of the while loop is determined through indentation. The statements inside the while starts with indentation and the first unindented line marks the end.
3. **What is the purpose of pass statement?**
   It is used when a statement is required syntactically but you don't want any code to execute. It is a null statement, nothing happens when it is executed.
4. **What is linear search?**
   Linear search is a sequential searching algorithm where we start from one end and check every element of the list until the desired element is found.
5. **Relate string and list**
   The similarity between Lists and Strings in Python is that both are sequences. The differences between them are that firstly, Lists are mutable but Strings are immutable. Secondly, elements of a list can be of different types whereas a String only contains characters that are all of String type.
6. **Find the syntax error in the code given**
   while True print("hello World")
   In while loop indentation i.e : is missing.

7. **Define conditional statements and list its types**
   conditional is used to test a condition,the control flow of execution is tested.
   - Conditional if
   - Alternative if… else
   - Chained if…elif…else
   - Nested if….else
8. **Define break and continue statement with example**
   Break statements can alter the flow of a loop.It terminates the current loop and executes the remaining statement outside the loop. if the loop has else statement, that will also gets terminated and come out of the loop completely.

   for i in "welcome":

```
if(i=="c"):
 break
print(i)
```
ouput: w e l

Continue:

It terminates the current iteration and transfer the control to the next iteration in the loop.

```
for i in "welcome":
 if(i=="c"):
continue
print(i)
```
ouput:

w e l o m e

9. Define fruitful functions and give example

A function that returns a value is called fruitful function.

Example:

```
Root=sqrt(25)
```
Example:

```
def add():
a=10
b=20
c=a+b
 return c
c=add()
print(c)
```
10. Define list.

List is an ordered sequence of items. Values in the list are called elements / items It can be written as a list of comma-separated items (values) between square brackets[ ]. Items in the lists can be of different data types.

11. Define local and global variable with example

The scope of a variable refers to the places that you can see or access a variable.A variable with global scope can be used anywhere in the program It can be created by defining a variable outside the function.Local Scope A variable with local scope can be used only within the function .

12. Define python strings

A String in Python consists of a series or sequence of characters - letters, numbers, and special characters. Strings are marked by quotes: single quotes (' ') Eg, 'This a string in single quotes' double quotes (" ") Eg, '"This a string in double quotes"' triple quotes(""" """) Eg, This is a paragraph. It is made up of multiple lines and sentences."""" Individual character in a string is accessed using a subscript (index). Characters can be accessed using indexing and slicing operations Strings are immutable i.e. the contents of the string cannot be changed after it is created.

13. Define slicing in strings

Slice operator is used to extract part of a data type.

```
>>> s="good morning"
>>> print(s[2:]) od morning
```
- Displaying items from 2nd till last.

```
>>> print(s[:4]) Good
```
- Displaying items from 1st position till 3rd .

14. Write a python program to accept two numbers and multiply them and print the result.

```
p = int(input("Enter first number: "))
q = int(input("Enter second number: "))
result = p * q;
print("Multiplication of two numbers:", result)
```

Output of the above code-

```
Enter first number: 54
Enter second number: 36
Multiplication of two numbers: 1944
```

15. What are chained conditionals?

Sometimes there are more than two possibilities and we need more than two branches. One way to express a computation like that is a chained conditional:

Eg:

```
if x < y:
     print 'x is less than y'
elif x > y:
    print 'x is greater than y'
else:
    print 'x and y are equal'
```

elif is an abbreviation of "else if." Again, exactly one branch will be executed. There is no limit on the number of elif statements. If there is an else clause, it has to be at the end, but there doesn't have to be one.

16. Explain 'for loop' with example.

The general form of a for statement is

Syntax:

```
for variable in sequence:
       code block
```

Eg:

```
x = 4
for i in range(0, x):
    print i
```

17. Explain about string module.

The string module contains number of useful constants and classes, as well as some deprecated legacy functions that are also available as methods on strings.

18. Mention a few string functions.

s.captilize() – Capitalizes first character of string
s.count(sub) – Count number of occurrences of sub in string
s.lower() – converts a string to lower case
s.split() – returns a list of words in string

16 marks

1. Outline the conditional branching statements in python with examples.
2. Outline while, break and continue statement in python with example programs.
3. Write a python program for linear search and binary search and explain it with an example of your choice.
4. Explain various strings in python.
5. Explain types of iteration or loop with examples
6. Explain in detail about parameter passing techniques.
7. Define function. Explain about different function prototypes with examples.
8. Write a python program to print first n numbers divisible by 5 using while loop.
9. Write a python program for finding factorial of given number with and without using recursive function.
10. Python strings are immutable. Justify with an example
11. Write a python program for finding gcd of two numbers, exponentiation of a number, square

root of a number

UNIT IV
Part A

1. What is a list?

A list is an ordered set of values, where each value is identified by an index. The values that make up a list are called its elements. Lists are similar to strings, which are ordered sets of characters, except that the elements of a list can have any type.

2. Solve a)[0] * 4 and b) [1, 2, 3] * 3.

>>> [0] * 4 [0, 0, 0, 0]
>>> [1, 2, 3] * 3 [1, 2, 3, 1, 2, 3, 1, 2, 3]

3.Let list = ['a', 'b', 'c', 'd', 'e', 'f']. Find a) list[1:3] b) t[:4] c) t[3:] .

>>> list = ['a', 'b', 'c', 'd', 'e', 'f']
>>> list[1:3] ['b', 'c']
>>> list[:4] ['a', 'b', 'c', 'd']
>>> list[3:] ['d', 'e', 'f']

4.Mention any 5 list methods.

append() ,extend () ,sort(), pop(),index(),insert and remove()

5.State the difference between lists and dictionary.

List is a mutable type meaning that it can be modified whereas dictionary is immutable and is a key value store. Dictionary is not ordered and it requires that the keys are hashable whereas list can store a sequence of objects in a certain order.

6.What is List mutability in Python? Give an example.

Python represents all its data as objects. Some of these objects like lists and dictionaries are mutable, i.e., their content can be changed without changing their identity. Other objects like integers, floats, strings and tuples are objects that cannot be changed.

Example:

>>> numbers = [17, 123]
>>> numbers[1] = 5
>>> print numbers [17, 5]

7.What is aliasing in list? Give an example.

An object with more than one reference has more than one name, then the object is said to be aliased.
Example: If a refers to an object and we assign b = a, then both variables refer to the same object:

>>> a = [1, 2, 3]
>>> b = a
>>> b is a True

8.Define cloning in list.

In order to modify a list and also keep a copy of the original, it is required to make a copy of the list itself, not just the reference. This process is called cloning, to avoid the ambiguity of the word "copy".

9.Explain List parameters with an example.

Passing a list as an argument actually passes a reference to the list, not a copy of the list. For example, the function head takes a list as an argument and returns the first element:

```
def head(list):
  return list[0]
```

output:
>>> numbers = [1, 2, 3]
>>> head(numbers)

10.Write a program in Python to delete first element from a list.

```
def deleteHead(list):
   del list[0]
```

Here's how deleteHead is used:

```
>>> numbers = [1, 2, 3]
>>> deleteHead(numbers)
>>> print numbers [2, 3]
```

11.Write a program in Python returns a list that contains all but the first element of the given list.

```
def tail(list):
    return list[1:]
```

Here's how tail is used:

```
>>> numbers = [1, 2, 3]
>>> rest = tail(numbers)
>>> print rest [2, 3]
```

12.What is the benefit of using tuple assignment in Python?

It is often useful to swap the values of two variables. With conventional assignments a temporary variable would be used. For example, to swap a and b:

```
>>> temp = a
>>> a = b
>>> b = temp
```

This solution is cumbersome; tuple assignment is more elegant:

```
>>> a, b = b, a
```

13. Define key-value pairs.

The elements of a dictionary appear in a comma-separated list. Each entry contains an index and a value separated by a colon. In a dictionary, the indices are called keys, so the elements are called key-value pairs.

14. Define dictionary with an example.

A dictionary is an associative array (also known as hashes). Any key of the dictionary is associated (or mapped) to a value. The values of a dictionary can be any Python data type. So dictionaries are unordered key-value-pairs.

Example:

```
>>> eng2sp = {} # empty dictionary
>>> eng2sp['one'] = 'uno'
>>> eng2sp['two'] = 'dos'
```

15. How to return tuples as values?

A function can only return one value, but if the value is a tuple, the effect is the same as returning multiple values. For example, if we want to divide two integers and compute the quotient and remainder, it is inefficient to compute x/y and then x%y. It is better to compute them both at the same time.

```
>>> t = divmod(7, 3)
>>> print t (2, 1)
```

16. List two dictionary operations.

Del -removes key-value pairs from a dictionary
Len - returns the number of key-value pairs

17. Define dictionary methods with an example.

A method is similar to a function—it takes arguments and returns a value— but the syntax is different. For example, the keys method takes a dictionary and returns a list of the keys that appear, but instead of the function syntax keys(eng2sp), method syntax eng2sp.keys() is used.

>>> eng2sp.keys() ['one', 'three', 'two']

18. Define List Comprehension.

List comprehensions apply an arbitrary expression to items in an iterable rather than applying function. It provides a compact way of mapping a list into another list by applying a function to each of the elements of the list.

19. Write a Python program to swap two variables.

```
x = 5
y = 10
temp = x x = y
y = temp
print('The value of x after swapping: {}'.format(x))
print('The value of y after swapping: {}'.format(y))
```

Part B & C (16 marks & 8 marks)

1. Discuss about list operations, list slices, list methods ,list loop, mutability, aliasing,cloning lists, list parameters
2. Explain about Tuples: tuple assignment, tuple as return value and tuple methods with examples.
3. Explain in detail about mutability and tuples with a Python program.
4. Write a python program to exchange the values of two variables (with or without temporary variable)
5. Write a python program for histogram, Students marks statement, Retail bill preparation.
6. Define sorting.Discuss about various sorting methods.
7. Write short notes on list comprehension..
8. Discuss about Dictionaries: operations and methods in detail wit example.
9. Write a python program for insertion sort, selection sort, merge sort, bubble sort.
10. Write a python program for matrix addition,subtraction,multiplication, transpose of a matrix.
11. Define Dictionary in python. Do the following operations on dictionaries.
    i. Initialize two dictionaries with keys and values.
    ii. Compare two dictionaries with master key list and print missing keys.
    iii. Find keys that are in first and not in second dictionary.
    iv. Find same keys in two dictionaries
    v. Merge two dictionaries and create a new dictionary using a single expression.

UNIT V

Part A

1. What is a text file?

A text file is a file that contains printable characters and whitespace, organized in to lines separated by newline characters.

2. Write a python program that writes "Hello world" into a file.

```
f =open("ex88.txt",'w')
f.write("hello world")
f.close()
```

3. Write a python program that counts the number of words in a file.

```
f=open("test.txt","r")
content =f.readline(20)
words =content.split()
 print(words)
```

4. What are the two arguments taken by the open() function?

The open function takes two arguments : name of the file and the mode of operation.

Example: f = open("test.dat","w")

5. What is a file object?

A file object allows us to use, access and manipulate all the user accessible files. It maintains the state about the file it has opened.

Example: f = open("test.dat","w") // f is the file object.

6. What information is displayed if we print a file object in the given program?

f= open("test.txt","w")

print f

The name of the file, mode and the location of the object will be displayed.

7. What is an exception?

Whenever a runtime error occurs, it creates an exception. The program stops execution and prints an error message.

Example:

#Dividing by zero creates an exception: print 55/0

ZeroDivisionError: integer division or modulo

8. What are the two parts in an error message?

The error message has two parts: the type of error before the colon, and specification about the error after the colon.

Example:

```
>>> 10 * (1/0)
Traceback (most recent call last):
File "<stdin>", line 1, in ?
ZeroDivisionError: integer division or modulo by zero
```

9. What are the error messages that are displayed for the following exceptions?

a. Accessing a non-existent list item

b. Accessing a key that isn't in the dictionary

c. Trying to open a non-existent file

a. IndexError: list index out of range

b. KeyError: what

c. IOError: [Errno 2] No such file or directory: 'filename'

10. How do you handle the exception inside a program when you try to open a non-existent file?

```
filename = raw_input('Enter a file name: ')
 try:
f = open (filename, "r")
except IOError:
print 'There is no file named', filename
```

11. How does try and execute work?

The try statement executes the statements in the first block. If no exception occurs, then except statement is ignored. If an exception of type IOError occurs, it executes the statements in the except branch and then continues.

Example:

```
try:
print "Hello World" except:
print "This is an error message!"
```

12. What is the function of raise statement? What are its two arguments?

The raise statement is used to raise an exception when the program detects an error. It takes two arguments: the exception type and specific information about the error.

13. What is a pickle?

Pickling saves an object to a file for later retrieval. The pickle module helps to translate almost any type of object to a string suitable for storage in a database and then translate the strings back in to objects.

14. What is the use of the format operator?

The format operator % takes a format string and a tuple of expressions and yields a string that includes the expressions, formatted according to the format string.

Example:

```
>>> nBananas = 27
>>> "We have %d bananas." % nBananas 'We have 27 bananas.'
```

15. What are the two methods used in pickling?

The two methods used in pickling are

1. pickle.dump()
2. pickle.load().

To store a data structure, dump method is used and to load the data structures that are dumped, load method is used.

16. What are modules?(or) Write a note on modular design (Jan-2018)

- Modules are files containing Python definitions and statements (ex: name.py)
- Modules can contain executable statements along with function definitions.
- Each modules has its own private symbol table used as the global symbol table all functions in the module.
- Modules can import other modules.

17. What is a package?

Packages are namespaces that contain multiple packages and modules themselves. They are simply directories.

Example:from Game.Level.start import select_difficulty

18. Write a Python script to display the current date and time. (Jan-2018)

import datetime
print("date and time", datetime.datetime.now())

19. What is the special file that each package in Python must contain?

Each package in Python must contain a special file called init .py. init .py can be an empty file but it is often used to perform setup needed for the package(import things, load things into path, etc).
Example :
package/
init .py file.py file2.py file3.py subpackage/
init .py submodule1.py submodule2.py

20. How do you delete a file in Python?

The remove() method is used to delete the files by supplying the name of the file to be deleted as argument.
Syntax:

Example:
import os os.remove("ChangedFile.csv")
print("File Removed!")

21. How do you use command line arguments to give input to the program? (or) What is command line argument? (May 2019)

Python sys module provides access to any command-line arguments via sys.argv. sys.argv is the list of command-line arguments. len(sys.argv) is the number of command-line arguments.

Example:

import sys
program_name = sys.argv[0]
arguments = sys.argv[1:]
count = len(arguments)

22. How to view all the built-in exception in python.

The built-in exceptions using the local() built-in functions as follows.
Syntax:
This will return us a dictionary of built-in exceptions, functions and attributes.

23. What do you mean IndexError?

IndexError is raised when index of a sequence is out of range.
Example:
>>> l=[1,2,3,4,5]
>>> print l[6]
Traceback (most recent call last):
File "<pyshell#16>", line 1, in <module> print l[6]
IndexError: list index out of range

24. Find the syntax error in the code given:
while True print('Hello World') (Jan 2019)

In the above given program, colon is missing after the condition. The right way to write the above program is
while True:
print('Hello World')

25. Categorise the different types errors arises during programming. Interpret the following

python code (May 2019)

```
>>>import os
>>>cwd = os.getcwd()
>>>print cwd
```

Basic types of errors:
Syntax Error:
Raised by the parser when a syntax error is encountered. Semantic Error:
Raised by the parser when there is logical error in the program.
Here in the above given program, Syntax error occurs in the third line (print cwd) SyntaxError: Missing parentheses in call to 'print'.

26. How to use command line arguments in python? (Nov / Dec 2019)

Access to the command line parameters using the sys module. len(sys, argv) contains the number of arguments. To print all of the arguments str(sys,argv)

27. Write method to rename and delete files (Nov / Dec 2019)

os.rename(current_file_name, new_file_name)
os.remove(file_name)

Part B & C (16 marks & 8 marks)

1. Explain the commands used to read and write into a file with examples.
2. Name the different access modes for opening a file and outline the same.
3. What is an exception? Elaborate the exception handling in python.(try,raise,except)
4. Write a program to concatenate the contents of two file into one file. Get the input for two files from the user and concatenate it.
5. Discuss about the use of format operator in file processing.
6. Discuss about command line arguments in detail.
7. Write a python program for word count, copy file, Voter's age validation, Marks range validation (0-100).
8. Differentiate between Modules and packages.

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