

UNIVERSITY SOLVED PART – A QUESTIONS

UNIT - 1

1. what is an algorithm? **Jan 2018. Jan 2017**

- An algorithm is defined as a step by step procedure for solving a problem.
- It is a well-defined computational procedure consisting of a set of instructions that takes some value or set of values, as input and produces some value or set of values, as output.

2. Write an algorithm to accept two numbers, compute the sum and print the result. **Jan 2018**

Step 1: Start

Step 2: Read the numbers a & b

Step 3: Add a, b & store the result in c

Step 4: Print the value of c

Step 5: Stop

3. Write a pseudocode to accept two numbers, add the numbers and print the result. **Jan 2017**

BEGIN

READ a & b

CALCULATE $c = a + b$

PRINT c

END

4. How can you measure the quality of algorithm? **Model**

The following are the primary factors that are often used to judge the quality of the algorithms.

Time – To execute a program, the computer system takes some amount of time. The lesser is the time required, the better is the algorithm.

Memory – To execute a program, computer system takes some amount of memory space. The lesser is the memory required, the better is the algorithm.

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 one.

5. What is flowchart? Why is flowchart required? **Model**

Flow chart is defined as graphical representation of the logic for problem solving.

The purpose of flowchart is making the logic of the program clear in a visual representation.

6. List out the disadvantage of pseudocode. **Model**

- It does not provide visual representation of the program's logic.
- 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.

7. Write an algorithm for largest of two number. **Model**

Step 1: Start

Step 2: Read the numbers a & b

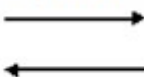






Step 3: If $a > b$, then goto step 4, else goto step 5

Step 4: print the value of a, then goto step 6

Step 5: print the value of b

Step 6: Stop

8. List the symbols used in drawing the flowchart. **April 2019**

Symbol	Symbol Name	Description
	Flow Lines	Used to connect symbols
	Terminal	Used to start, pause or halt in the program logic
	Input/output	Represents the information entering or leaving the system
	Processing	Represents arithmetic and logical instructions
	Decision	Represents a decision to be made
	Connector	Used to Join different flow lines
	Sub function	used to call function

9. Give the python code to find the minimum among the list of 10 numbers. **April 2019**

```
a=[1, 2, -8, 0]
```

```
min = a[0]
```

```
for i in a:
```

```
    if i < min:
```

```
        min = i
```

```
print(min)
```

10. Distinguish between algorithm and program. **Jan 2019**

Algorithms	Program
Systematic logical approach which is a well-defined, step-by-step procedure that allows a computer to solve a problem.	It is exact code written for problem by following all the rules of the programming language.
Algorithms are generally written in a natural language or plain English language	Program allows us to write a code in a particular programming language.

11. Write an algorithm to find the minimum number in a given list of numbers. **Jan 2019**

- Step 1: Start
- Step 2: Get a list of numbers in a
- step 3: Assign the first element of the list as min
- Step 4: For each element i in “a”, compare to min
- Step 5: If i is smaller than min then set min to i
- Step 6: print min value
- Step 8: Stop

12. Write an algorithm to insert a card in a list of sorted cards.

- Step 1: Start
- Step 2: Read the list of sorted cards
- Step 3: First card is already sorted
- Step 4: Pick next card
- Step 5: Compare with all cards in the sorted sub-list
- Step 6: Shift all the cards in the sorted sub-list that is greater than the value of the card to be inserted.
- Step 7: Insert a card
- Step 8: Repeat from step 4 until list is sorted
- Step 9: Stop

13. Write an algorithm to guess an integer number in a range.

- Step 1: Start
- Step 2: Generate a random number between 1 and 100 in R
- Step 3: Get the guessed number from user in X
- Step 4: If $R == X$, then goto step 5, else goto step 6.
- Step 5: Print “Correct guess”, then goto step 9
- Step 6: If $R > X$, then goto step 7, else goto step 8
- Step 7: Print ‘Too low’, then goto step 9

Step 8: Print 'Too High'

Step 9: Stop

14. Write an algorithm to tower of hanoi problem.

main () Step 1: Start Step 2: Read the no.of disks n Step 3: Call the function hanoi(n, source, dest, aux) Step 4: Stop	hanoi(n, source, dest, aux) Step 1: if n==1, then move n from source to dest. Step 2: Else move n-1 disks from source to aux move n th disk from source to dest move n-1 disks from aux to dest
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15. Define iteration or looping?

A set of statements are executed till the specified condition is true is called iterations.

16. Define Recursion?

- A function that calls itself is known as recursion.
- Recursion is a process by which a function calls itself repeatedly until some specified condition has been satisfied.

17. Define Function?

Function is a sub program which consists of block of code(set of instructions) that performs a particular task.

18. What is pseudocode?

Pseudocode is defined as short, readable, formally styled English language to explain an algorithm.

19. Define sequence.

All the instructions are executed one after another is called sequence execution.

20. Define selection.

Some portion of the programs are executed based upon the conditional test. If the conditional test is true, one part of the program will be executed, otherwise other part of the program will execute.

21. What are the building blocks of an algorithm?

Statements, State, Control Flow- Sequence, Selection, Iteration, Functions.

GE8151 : UNIVERSITY SOLVED PART-A QUESTIONS

UNIT – 2

1. Name the four types of scalar objects Python has. Jan 2018

Numbers, Sets, Sequence (String, tuple, List), Mapping (Dictionary).

2. What is a tuple? How literals of type tuple are written? Give example. Jan 2018

- A Tuple is an ordered collection of values of different datatype.
- Indexed by positive integer.
- These are immutable.
- It is enclosed in parentheses ()
- Values in tuples called as elements or items

Example: tuple1 = ('abcd', 345, 'python', 3.14)

```
print(tuple1)
```

```
('abcd', 345, 'python', 3.14)
```

3. Outline the modes Python interpreter works. Jan 2017

To execute the program code, the interpreter is used. There are two different modes to use the interpreter.

1. Interactive mode
2. Script mode

4. State the difference between (/) and (//) operators in python. Jan 2017

/ Float Division	Divides first operand by second operand and returns quotient
// Floor division (Integer division)	Divides first operand by second operand and returns quotient without fraction.

5. What is the difference between tuples and lists in python? Model

List	Tuple
The list is enclosed in square brackets []	The tuple is enclosed in parentheses ()
Mutable	Immutable

6. List out the points of precedence of operators. Model

When more than one operator appears in an expression, the order of evaluation depends on the rules of precedence.

7. Write the content of swapping of two numbers in a single line. Model

```
a=5
```

```
b=10
```

```
(a,b)=(b,a)
```

8. Define operator. Give example of operator. Model

An Operator is a symbol that perform operations on operands.

E.g., >>> 4 + 5 where 4 & 5 are operands, + is an operator.

Types of operators

1. Arithmetic operators
2. Relational (Comparison) operators
3. Assignment operators
4. Logical operators
5. Bitwise operators
6. Membership operators
7. Identity operators
8. Unary arithmetic operators

9. Outline the logic to swap the contents of two identifiers without using third variable.

April 2019

Refer Q. No. 7

10. State about Logical operators available in python language with example. April 2019

Operator	Usage	Description
and	a and b	Returns true, if both operands are true
or	a or b	Returns true, if any of the two operands are true
not	not a	Returns the logical negation of operand

Truth tables for and, or, and not.

Op1	Op2	Op1 and Op2	Op1	Op2	Op1 or Op2	Op1	Not op1
True	True	True	True	True	True	True	False
True	False	False	True	False	True	False	True
False	True	False	False	True	True		
False	False	False	False	False	False		

Program	Output
<pre>a=True b=False print('a and b : ', a and b) print('a or b: ', a or b) print('not a: ', not a)</pre>	<pre>a and b: False a or b: true not a: False</pre>

11. What are keywords? Give examples. Jan 2019

1. Keywords are the reserved words in Python.
2. We cannot use a keyword as variable name, function name or any other identifier.
3. They are used to define the syntax and structure of the Python language.
4. Keywords are case sensitive.

Examples

and	if	continue	try	def
or	elif	break	except	return
for	else	is	finally	true
while	print	in	raise	false

12. Define Python.

Python is a general-purpose, interpreted, interactive, object-oriented and high-level programming language.

13. What are the features of python language?

- General pupose programming language.
- Platform independent programming language.
- Simple high level language
- Easiily readable & understandable
- Easy to learn & use.

14. What is the difference between * and ** operator?

* is a multiplication operator which multiplies two operands. Eg: 2*3 returns 6

** is an exponnet operator that performs power calculatio. Eg. 2**3 returns 8

15. What is the difference between = and == operator?

= is an assignment operator used to used assign values from right side to left side operand.

Eg: a=10

== is a relational operator returns true, if the values of two operands are equal.

Eg: 5==5; True.

16. What is the difference between unary & binary operator?

Unary	Binary
Used with single operand.	Used with two operations.
Eg: +10 ,-20	Eg. 10+20, 5-3

17. What is type casting?

Type casting is the process of converting the value of an expression to a particular data type.

This is done in python with functions such as `int()`, `float()`, `str()`.

18. What is return statement?

It is used to return the control from calling function to the next statement in the program. It also return some values.

Example: `return`, `return 0`, `return (a+b)`

19. Difference between interactive mode and script mode.

Interactive Mode

When the python expression/statement/ command types after prompt(`>>>`), the python immediately responses with the output of it.

Eg: `>>> print('Hai')`

Hai

`>>> print(10*2)`

20

Script mode

The program can be stored in a file and the interpreter can be used to execute the file.

Note: Python filename ends with `.py` extension.

Run as Run → Run Module

20. Define literals.

A literal is a notation that represents a fixed value. A value can be a letter, String or Number.

Ex: `'a'`, `'Hello, World!'`, `10`.

GE8151 – Problem Solving and Python Programming

UNIT – 3 (PART - A)

1. Write a python program to accept two numbers, multiply them and print the result. **Jan 2018**

Program	Output
<pre>a=int(input('Enter a value:')) b=int(input('Enter b value:')) c=a*b print(c)</pre>	Enter a value:10 Enter b value:5 50

2. Write a python program to accept two numbers, find the greatest and print the result. **Jan 2018, Jan 2017**

Program	Output
<pre>a=int(input('Enter a value:')) b=int(input('Enter b value:')) if a>b: print(a) else: print(b)</pre>	Enter a value:10 Enter b value:5 10

3. Comment with an example on the use of local and global variable with the same identifier name. **April 2019**

Global scope: A variable with global scope can be used anywhere in the program.

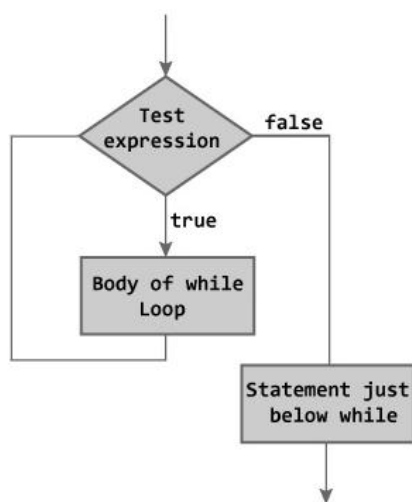
Program	Output
<pre>a=50 def add() b=20 c=a+b print(c) def sub() b=30 c=a-b print(c) add() sub() print(a)</pre>	70 20 50

Local Scope: A variable with local scope can be used only within the function.

Program	Output
<pre>def add() a=50 b=20 c=a+b print(c)</pre>	70

<pre>def sub() a=50 b=30 c=a-b print(c) add() sub() print(a)</pre>	<p>20 Error Error</p>
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4. Present the flow of execution for a while statement. **Jan 2019**



5. Define recursion with an example. **Jan 2019, Jan 2017, April 2019**

- Recursion is a process by which a function calls itself repeatedly until some specified condition has been satisfied.

Program: Factorial of n	Output
<pre>def fact(n): if(n==1) (n==0): return 1 else: return n*fact(n-1) n=int(input("Enter a Number:")) ans=fact(n) print(ans)</pre>	<p>Enter a Number: 5 120</p>

6. What is an array?

- An array is an ordered collection of values of same data type.
- Indexed by positive integer.
- Mutable
- Enclosed in square brackets.
- Value is also called as element or item.

7. What is the use of string module in python?

The string module is a file that offers additional functions, classes and variables to manipulate standard strings.

8. why do we call python string as immutable?

Python string is called as immutable because its characters can be accessed but it cannot be modified.

Program:	Output
S= 'hello, world!' s[0] = 'H'	TypeError: 'str' object does not support item assignment.

9. Define string slice.

A part of a string is called slice. The operator [m:n] returns the part of the string from mth index to n-1th index.

If m is omitted, the slice starts at the beginning of the string. Eg: [:5]

If n is omitted, the slice goes to the end of the string. Eg: [0:]

If $m \geq n$, the slice is an empty string.

If both m & n are omitted, the slice is a given string itself.

10. what is a string?

- String is a collection of characters/ letters
- Indexed by positive integer.
- immutable
- Enclosed in single quote ' ' or " "
- String of length 1 is called as character.

11. Define module. What are the ways to import modules in python?

Module is a python file that contains collection of related variables, functions, classes and other definition.

4 ways to import modules:

- 1) import module
- 2) from import
- 3) import with renaming.
- 4) import all

12. what are the advantages & disadvantages of recursion.

Advantages	Disadvantages
1. Code look clean and elegant	1, Hard to follow
2. Broken down complex problem into simpler sub-programs	2. Hard to debug

3. Sequence generation is easier than nested iterations.	3. Takes lot of memory and time.
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13. what is fruitful function?

A function that returns a value is called fruitful function

Program	Output
<pre> Def add(): a=10 b=20 c=a+b return c c=add() print(c) </pre>	30

14. what is void function?

A function that perform action but don't return any value

Program	Output
<pre> Def add(): a=10 b=20 c=a+b print(c) c=add() </pre>	30

15. Explain in short about stack diagram.

Stack diagram is a graphical representation of a stack of functions, their variables, and the values they refer to.

Def sub(x,y):

z=x-y

print(z)

a=10

b=5

sub(a,b)

16. Define function composition?

Function composition is a way of combining functions such that the result of each function is passed as argument of the next function.

Program	Output
<pre> def add(a,b) c=a+b return c </pre>	900

```
def mul(a,b )
    c=a*b
    return c

x=add(10,20)
y=mul(x,30)
print(y)
```

17. what are the types of branching or conditional statements available in python?

- Conditional (if)
- Alternative(if – else)
- Chained conditionals(if – elif-else)
- Nested conditionals

18. What are the looping or iteration statements available in python?

- While loop
- for loop
- nested loop

19. what are the loop control statements available in python?

- Break
- continue
- pass

20. what is the difference between break and continue statement?

	Break	Continue
1.	Stop the current iteration and jump out of the loop.	1. Stop the current iteration and continue for next iteration.
2.	Break; keyword is used	Continue; keyword is used

GE8151 PROBLEM SOLVING AND PYTHON PROGRAMMING

UNIT IV (PART - A)

1. What is a list? How lists differ from tuples? **Jan 2018**

LIST	TUPLE
Ordered collection of values of different type	Ordered collection of values of different type.
Indexed by positive integer	Indexed by positive integer
Mutable	Immutable
Enclosed in square brackets []	Enclosed in paranthesis()
Item deletion is possible	Item deletion is not possible

2. How to slice a list in Python? **Jan 2018**

A part of a list is called slice. The operator [m:n] returns the part of the list from m th index to n-1 th index.

If m is omitted, the slice starts at the beginning. Eg: [:5]

If n is omitted, the slice goes to the end. Eg: [0:]

If $m \geq n$, the slice is an empty. Eg: [3:1]

If both m & n are omitted, the slice is a given list itself. Eg: [:]

Slicing on list [:] [start_at : end_at -1] l=[10,20,30,40,50]	>>>print(l[:3]) [10,20,30]	Print items from index 0 to 2
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3. What is a list in python? Give example. **Jan 2017**

Refer Q. No.1

4. Write the syntax for concatenating two lists in Python. **Jan 2017**

Concatenation List	on >>>l=[10,20,30] >>>print(l+l) [10,20,30,10,20,30]	Print concatenated list
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5. How to create a list in python? Illustrate the use of negative indexing of list with example.

April 2019

Indexing on list [] l=[10,20,30,40,50]	>>l[-3] [30]	Print item index at -3
	>>l[::-1] [50,40,30,20,10]	Reverse the list
Slicing [:]	>>l[-3:-1] [30,40]	Print item from item -3 to -2

6. Demonstrate with simple code to draw the histogram in python. **April 2019**

7. Relate strings and lists. **Jan 2019**

LIST	STRING
Ordered collection of values of different type	Ordered collection of values of different type.
Indexed by positive integer	Indexed by positive integer
Mutable	Immutable
Enclosed in square brackets []	Enclosed in single quote or double quotes
Item deletion is possible	Item deletion is not possible
Eg: l=[10,20,30]	Eg: s='happy'

8. Give a function that can take a value and return the first key mapping to that value in a dictionary. **Jan 2019**

Program	Output
<pre>def reverse_lookup(d, v): for k in d: if d[k] == v: return k h = histogram('parrot') key = reverse_lookup(h, 2) print(key)</pre>	r

9. Define lookup.

Lookup is the process of finding the corresponding value for the given key from dictionary.

10. Define reverse lookup.

Reverse lookup is the process of finding the key for a given value.

11. Define cloning.

- The process of creating a copy of a same list of elements with two different memory locations is called cloning.
- Changes in one list will not affect another list.

12. Define aliasing.

- The process of creating a copy of a same list of elements with same memory locations is called aliasing.
- Changes in one list will affect another list.

13. Define list comprehension.

Comprehension are constructs that allows sequences to be built from other sequences. List comprehension can be used for filtering.

Comprehension consists of following parts

- An Input Sequence
- Variables representing members of the input sequences
- An optional predicate expression
- An output expression producing elements of the output list.

14. List some methods in list.

`append(element)` – adds the given element at the end of the list.

`count(element)` – count the no.of occurrence of an element in list.

`extend(another-list)`- adds the elements of another-list at the end of the list.

`insert(index,element)` – Insert the element at the given index in a list.

15. List some methods in tuple

`count(element)` – count the no.of occurrence of an element in tuple.

`index(element)` – returns index of the element.

16. Differentiate `append ()` and `extend()` method.

`append(element)` – adds the given element at the end of the list.

`extend(another-list)`- adds the elements of another-list at the end of the list.

17. List the various ways of traverse a list.

- For loop
- While loop
- Infinite loop

18. List the 3 ways of cloning.

- `List ()`
- `copy.copy()`
- `copy.deepcopy()`

19. Define list as parameters.

- When a list is passed to function, the function gets a reference to the list. Passing a list as an argument actually passes a reference to the list, not a copy of the list.
- Since lists are mutable, changes made to the parameters change the argument.

20. Define tuple as return value.

A function can return one value. If you want more than one value from a function, we can use tuple as return value.

GE8151 PROBLEM SOLVING AND PYTHON PROGRAMMING

UNIT V (PART – A)

1. Write a python script to display the current date and time. **Jan 2018**

```
import datetime
now = datetime.datetime.now()
print ("Current date and time : ")
print (now.strftime("%Y-%m-%d %H:%M:%S"))
```

2. Write a note on modular design. **Jan 2018**

Modular programming is to develop programs which are readable, reliable and maintainable without too much effort by using some kind of modular software design. These are called modules.

3. What is an exception? Give example. **Jan 2017.**

An exception is an error that occurs during execution of a program. It is also called as run time errors.

Example:

1. Division by zero.
2. Performing operations with incompatible types
3. Using an identifier which has not been defined.
4. Accessing an element which is not in list or tuple or dictionary
5. Access to a file or fileobject which does not exist.

4. Write the syntax for opening a file in python for reading only. **Jan 2017.**

fileobject=open('filename.txt', 'r')

5. Categorise the different types of errors arises during programming. Interpret the following python code. **April 2019**

```
>>> import os
>>> cwd = os. Getcwd()
>>> print cwd
/home/dinsdale
```

Answer: AttributeError: module 'os' has no attribute 'Getcwd'.

Various Errors are: ArithmeticError, ZeroDivisionError, TypeError, NameError, ValueError, KeyError, IOError, IndexError.

6. What is command line argument? **April 2019**

Command-line arguments are the arguments passed into the program from the command line prompt. While execution, command line arguments are given along with program name.

7. What is a module? Give example. **Jan 2019**

- A module is a file containing python definitions, functions, statements and instructions.
- Standard library of python is extended as modules.
- Import the modules to use them in programs.
- Examples: math, os, sys, Random

8. Find the syntax error in the code given: **Jan 2019**

```
While True print ('Hello world')
```

Syntax Error: Invalid Syntax

9. What is meant by file? List out types of files supported by Python.

A file is a collection of data stored in a particular area on the disk. To keep the data permanent, files are used.

There are two types of file

- Text File
- Binary File

10. Enumerate the different modes of operations for file manipulation

r	Opens a file for reading only. The file pointer is placed at the beginning of the file. This is the default mode.
rb	Opens a file for reading only in binary format. The file pointer is placed at the beginning of the file. This is the default mode.
r+	Opens a file for both reading and writing. The file pointer placed at the beginning of the file.
rb+	Opens a file for both reading and writing in binary format. The file pointer placed at the beginning of the file.
w	Opens a file for writing only. Overwrites the file if the file exists. If the file does not exist, creates a new file for writing.
wb	Opens a file for writing only in binary format. Overwrites the file if the file exists. If the file does not exist, creates a new file for writing.
w+	Opens a file for both writing and reading. Overwrites the existing file if the file exists. If the file does not exist, creates a new file for reading and writing.
wb+	Opens a file for both writing and reading in binary format. Overwrites the existing file if the file exists. If the file does not exist, creates a new file for reading and writing.
a	Opens a file for appending. The file pointer is at the end of the file if the file exists. That is, the file is in the append mode. If the file does not exist, it creates a new file for writing.
ab	Opens a file for appending in binary format. The file pointer is at the end of the file if the file exists. That is, the file is in the append mode. If the file does not exist, it creates a new file for writing.
a+	Opens a file for both appending and reading. The file pointer is at the end of the

	file if the file exists. The file opens in the append mode. If the file does not exist, it creates a new file for reading and writing.
ab+	Opens a file for both appending and reading in binary format. The file pointer is at the end of the file if the file exists. The file opens in the append mode. If the file does not exist, it creates a new file for reading and writing.

11. Differentiate module vs package.

Module is a single Python file containing function definitions; A package is a directory (folder) of Python modules containing an additional `__init__.py` file, to differentiate a package from a directory.

12. Define User-Defined Exceptions.

Programmers may name their own exceptions by creating a new exception class. Exceptions need to be derived from the Exception class, either directly or indirectly.

13. Define Exception handling.

Exception handling is done by try and catch block. A block of code that create an exception is placed in try block. A block of code which handles the exception is placed in except block.

14. List the types of catching exceptions.

1. try...except
2. try...except...inbuilt exception
3. try... except...else
4. try...except...else....finally
5. try.. except..except..
6. try...raise..except..
7. User – defined Exception

15. Define Error. Mention its type.

Error is also known as bugs. They are always the mistake made by programmer.

There are two types of error.

- Logical Error
- Syntax Error

16. Define Logical Error with an example.

Error occurs due to the mistake in the logic of the program.

Examples

1. Using integer division instead of floating point division
2. Intending the block to a wrong level.

17. Define Syntax Error with an example.

Errors are caused by invalid syntax. In Python, syntax errors are identified only during program execution. It displays error message and stop without continuing execution process.

Examples

1. Misspelling a keyword
2. Leaving out a symbol such as colon, comma or brackets
3. Putting a keyword in a wrong place

18. Define format operator with its types.

The write() accept only string as arguments. To give other values in write(), the values must be converted to string.

Methods – 1 : str()

Method – II : Format operator %

19. Define the various file operation.

A file operation takes place in the following order.

1. Open a file
2. Read or write (perform operation)
3. Close the file

20. List some file methods.

Method	Description
close()	Close a file after it has been opened:
read()	Read the content of the file
readline()	Read the first line of the file
readlines()	Return all lines in the file, as a list where each line is an item in the list object: