UG/Integrated Even Semester Examination, 2025

COMPUTER SCIENCE

(2nd Semester)

Course No.: MCS-552/MCA-552

(Programming in Python)

Full Marks: 70

Pass Marks: 28

Time: 3 hours

The figures in the right margin indicate full marks for the question.
Answer any five questions selecting one from each unit.

UNIT-I

1. (a) Explain comments and doc strings in Python. 2+2=4

   (b) What do the following statements in Python mean? 2x3=6

   Pass, Assert, NONE

   (c) Write a function in Python to find prime numbers upto 100. 4

2. (a) What is bool type in Python? 2

   (b) How does program get access to a module? Explain module with an example. 1+7=8

   (c) What does the function input signify in Python? What is the return type of input? How can you convertthat return type into other types. 2+1+1=4

UNIT-II

3. (a) Write a function in Python to test whether an input is plaindrome or not. 5

(b) Write a function in Python to find all the factor of a number n. 3

(c) Write a function in Python to flatten a list. 6

4. (a) Write a function in Python to find first n prim numbers. 4

(b) Explain with an example how a function can be passed as an argument to another function. 5

(c) Explain with an example how function chaining takes place in Python. 5

UNIT-III

5. (a) Discuss mutabilty or otherwise of the following data types with suitable examples string, list, tuple, dictionary. 2x4=8

(b) Suppose there exits a string S= 'New York'. What are the following : 1x3=3

(i) S[:3]

(ii) S[2:]

(iii) S[–1:]

(c) For the string given in (b) answer the following :

(i) Is S[0] = 'A' possible? Justify. 1

(ii) What is S=S[0:3]+ "c.r". Does S remain the same after the above operation? Justify. 2

(b) Write a function pairwise-div with parameters Lnum & Ldenom where Lnum and Ldenom are non empty lists of equal length. Also Lnum and Ldenom should not contain duplicates.

The function returns a new list whose elements are pairwise division of an element in Lnum by an element in Ldenom.

Raise appropriate assertions and exceptions.

Also raise Value Error when elements from Lnum are removed. 7

(c) Why are exceptions a good example of defensive programming. 3

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6. (a) What is a lambda function? Explain with a suitable example the environment / scope that gets creatd during the execution of a lambda function. 2+4=6

(b) Explain list comprehension with a suitable example. 3

(c) Explain why cloning is necessary in Python. 5

UNIT-IV

7. (a) How do you create a copy of a list using a slice? 2

(b) Suppose there are 3 lists as follows :

list 1= [1, 3, 5, 7]
list 2= [1, 3, 5, 7]
list 3= list 2

What does the following return? 4

(i) list 1 = = list 2
(ii) list 2 = = list 3
(iii) list 3 = = list 3
(iv) list 1 is list 2

(c) Write a recursive function to return the total length of all strings in the list. 4

(d) Write a recursive function to find the length of a list. 4

8. (a) What is a tuple? What is the difference between a list and a tuple? 1+1=2

(b) Suppose there is a tuple object a tuple which is of the form

a Tuple= ((1, “abc”), (2, “def),(4, “xyz”), (5, “abc”))

Write a functon which iterates over a Tuple finds the minimum and maximum number & also the number of unique words. 5

(c) (i) What is a dictionary? 1

(ii) What can be the data types for the keys in a dictionary? Are the keys mutable? Justify. 1+2=3

(iii) Give an example to show evcation of nested dictionaries. 3

UNIT-V

9. (a) Why is Python not good at information hiding? 3

(b) Explain the following : 2x3=6

- - str - - (self) - - lt - - (self, other)

- - eg - - (self, other)

(c) Create a class Intset deriving from object which has vals (a list) as object variable. The class should have the following :

Insert function to insert into vals check whether a member is in vals.

Remove a member from vals print the members of vals in the form of a set. For eg if vals= [3,4,5]. The output should be {3,4,5}. 5

10. (a) What is exception? What is the difference between exception and assertion? 2+2=4