

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2024  
(Fourth Semester)

Branch - MATHEMATICS WITH COMPUTER APPLICATIONS

DATA ANALYTICS WITH R PROGRAMMING AND PYTHON

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- Which are indexed by either row or column using a specific name or number?  
(i) Datasets (ii) Data frames (iii) Data (iv) Functions
- What will be the output of the following R code snippet?  
> paste("a", "b", se = ":")  
(i) "a+b" (ii) "a=b" (iii) "a b : " (iv) none of the mentioned
- Mention the output of the following Python function.  
len(["hello",2, 4, 6])  
(i) Error (ii) 6 (iii) 4 (iv) 3
- Identify the output of the following Python code snippet.  
for i in [1, 2, 3, 4][::-1]:  
print(i, end=' ')  
(i) 4 3 2 1 (ii) error (iii) 1 2 3 4 (iv) none of the mentioned
- State the output of the following Python statement.  
1. >>>"a"+"bc"  
(i) bc (ii) abc (iii) a (iv) bca

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- a Two vectors X and Y are defined as follows –  $X \leftarrow c(3, 2, 4)$  and  $Y \leftarrow c(1, 2)$ . Bring out the output of vector Z that is defined as  $Z \leftarrow X*Y$ . in R  
OR  
b Narrate the output of the below code in R-  
printmessage <- function (a) {  
if (is.na (a))  
print ("a is a missing value!")  
else if (a < 0)  
print ("a is less than zero")  
else  
print ("a is greater than or equal to zero")  
invisible (a)  
}  
printmessage (NA)

Cont ...

- 7 a If you which to know all the values in c (1, 3, 5, 7, 10) that are not in c (1, 5, 10, 12, 14), which in-built function in R can be used to do this? Explain how this can be achieved without using the in-built function.  
OR
- b State and explain a function in R language to replace the missing value in a vector with the mean of that vector.
- 8 a There is a function  $fn(a, b, c, d, e) = a + b * c - d / e$ . Produce the code to call fn on the vector c(1,2,3,4,5) such that the output is same as fn(1,2,3,4,5) in Python.  
OR
- b Outline a function to extract the first name from the string "Mr. Tom White" in Python.
- 9 a Given two arrays, narrate a python function to return the intersection of the two. For example, X = [1,5,9,0] and Y = [3,0,2,9] it should return [9,0]  
OR
- b Given an array, bring out all the duplicates in this array in Python. For example: input: [1,2,3,1,3,6,5] output: [1,3]
- 10 a Given an integer array describe how to return the maximum product of any three numbers in the array using Python.  
OR
- b Summarize the concept of negative Indexing in Python.

**SECTION -C (30 Marks)**

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 6 = 30)

- 11 a Analyze how will you merge two dataframes in R programming language.  
OR
- b Discuss in detail about data structions in R.
- 12 a Suppose you have a dataset 'CallRecords.csv' that contains the two columns: 'dur\_min' and 'balance'. Analyze how will you plot a graph of the two variables in R.  
OR
- b Discuss how will you create scatterplot matrices in R language.
- 13 a Differentiate between lists, arrays, and sets in Python, and examine when you should use each of them.  
OR
- b Compare break, continue and pass in Python.
- 14 a Discuss how can you make a tuple out of a list in Python.  
OR
- b Trace a Python program that calculates the mean of numbers in a list.
- 15 a Discuss about data extraction in Pandas library  
OR
- b Summarize in detail about various charts using plot ( ) function.

Z-Z-Z

END