Q1. What are the benefits of the built-in array package, if any?

A benefit of python’s in built array over the numpy array is that we can add any data type in that while numpy arrays are supposed to be of the same data type

Q2. What are some of the array package's limitations?

Data storage requires contiguous memory allocation for operations such as deletion and insertion in the array.

NaN stands for non a number. It was designed to take place wherever it finds the empty values. But this values makes difficult for the python interpreter to compare with empty objects

Q3. Describe the main differences between the array and numpy packages.

The main difference between array and numpy array is speed of calculation of operations. The numpy arrays require much less space than the arrays to store their values.

Q4. Explain the distinctions between the empty, ones, and zeros functions.

Empty function gives array of the same value as that of defined but no values are assigned.

Ones function creates a array of the same size as defined and sets the value of element to 1

Zeroes function creates a array of the same size as defined and sets the value of the element to 0

Q5. In the fromfunction function, which is used to construct new arrays, what is the role of the callable argument?

Callable argument means that a function is called with n parameters and n is the rank of shape of the array.

Q6. What happens when a numpy array is combined with a single-value operand (a scalar, such as an int or a floating-point value) through addition, as in the expression A + n?

It will simply add the int value or floating-point value to all the elements in array.

Q7. Can array-to-scalar operations use combined operation-assign operators (such as += or \*=)? What is the outcome?

Yes it uses these combined operations. The output is imputed to the variable on which the operation is performed.

Q8. Does a numpy array contain fixed-length strings? What happens if you allocate a longer string to one of these arrays?

It is true that we numpy arrays can hold only fixed length strings. If try to put the string of longer length then numpy will automatically discard it.

But if we want to allocate the longer length of the strings then we can also do that in numpy.

Q9. What happens when you combine two numpy arrays using an operation like addition (+) or multiplication (\*)? What are the conditions for combining two numpy arrays?

It will simply add that number with other number which is on the same location. The condition that needs to be met is that the numpy arrays should have same dimension for addition and for multiplication the number of rows of the array 2 should be equal to the number of columns of the array 1.

Q10. What is the best way to use a Boolean array to mask another array?

We use comparison operators to get Boolean array. The best way is to use when we have a particular condition and we want to check and compare the results with array.

Q11. What are three different ways to get the standard deviation of a wide collection of data using both standard Python and its packages? Sort the three of them by how quickly they execute.

1. import statistics

statistics.stdev(<numbers>)

1. import numpy as np

np.std(<array>)

1. import pandas as pd

pd.std(<list or array>)

12. What is the dimensionality of a Boolean mask-generated array?

It means that after performing the masking operation, the dimensionality of the array gets reduced to 1 d array.