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

Answer: Following are the benefits of functions which are included in built in array package:

1. Type() function helps in knowing which type of elements can be stored inside an array.
2. Size() helps in knowing the size of the array
3. Appending and extending the array size in case of insertion of elements at a particular place or at last index in the array.
4. We can manipulate the index
5. Converting the array to a list by simply type casting .

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

Answer: If we create an array use array package then we need to make sure that all the elements of the array must of the same data type.

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

Answer: If we create array of elements using the array module , we need to create array of elements having same data types and in the case of numpy packages, we can create an array with an object type.

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

Answer: Empty function in numpy module returns a one/multi dimensional lists with appropriate shape with no values in them. Ones function in the same module gives us a list containing 1’s of the required length. Zeros function in numpy module works in the same way as ones but gives a list of ones here instead of zeros in previous case.

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

Answer: In this fromfunction() in numpy module contains the main function definition which is will be used for some operation based on the shape and data type that we want to get the results from.

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?

Answer: It will add/multiply/divide or any arithmetic operations on the individual list element by that one scalar values.

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

Answer: The outcome would be an updated scalar.

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

Answer: Numpy array have fixed a length with same data elements initialized during array creation and you cannot allocate a new value to the array once the array creation is done.

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?

Answer: Combining 2 numpy arrays of same or different sizes will give the final result which will solely depend on the elements present in 2 arrays whatever the length of the two numpy arrays would be.

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

Answer: We can use some methods like values thresholding to compare array values and then assign values like 0 or 1 based on our need and also use the array elements to go through a mod function by a particular value and then used remainder values for assigning as indexes.

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.

Answer: We can use stddev() in stats module, or python’s pstddev() function , or we can simply calculate the std deviation from python via manual formula usage and data passed to it. Stddev() is obviously the fastest method to calculate the standard deviation from all the 3 methods.

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

Answer: When you try to keep the dimensionality same as before masking , you need to enter values as to retain the dimensionality ass after masking , the dimensionality is generally lost.