Q1. What is a probability distribution, exactly? If the values are meant to be random, how can you predict them at all?

**Ans:**

Probability distributions are a function, table, or equation that shows the relationship between the outcome of an event and its frequency of occurrence.

e.g for dice roll possible outcomes will be: 1, 2, 3, 4, 5, 6 and their individual probabilities will be 1/6, 1/6, 1/6, 1/6, 1/6, 1/6

Also, for random values the same concept will work.

Q2. Is there a distinction between true random numbers and pseudo-random numbers, if there is one? Why are the latter considered “good enough”?

**Ans:**

Random is “truly random” - completely unpredictable. What comes before gives you no indication of what will come next whatsoever.

Pseudorandom sequences meet the statistical descriptions of randomness, but in fact arise from an algorithm, such that you can predict every single value. In fact, you simply compute the next value from the previous values in a well-determined way.

Pseudorandom sequences are “good enough” because you can use them to test a system’s response to random input, but at the same time you can perfectly duplicate input sequences, for example to recreate error conditions and so on.

Q3. What are the two main factors that influence the behaviour of a "normal" probability distribution?

**Ans:**

Normal distribution depends on two factors - the mean and the standard deviation. The mean of the distribution determines the location of the center of the graph, and the standard deviation determines the height and width of the graph.

Q4. Provide a real-life example of a normal distribution.

**Ans:**

Flipping a coin is one of the oldest methods for settling disputes. We all have flipped a coin before a match or game. The perceived fairness in flipping a coin lies in the fact that it

has equal chances to come up with either result. The chances of getting head are 1/2, and the same is for tails. When we add both, it equals to one. If we toss coins multiple times,

the sum of the probability of getting heads and tails will always remain 1.

Q5. In the short term, how can you expect a probability distribution to behave? What do you think will happen as the number of trials grows?

**Ans:** Probability distributions are helpful because they can be used as a graphical representation of your measurement functions and how they behave. When you know how your measurement function have performed in the past, you can more appropriately analyze it and predict future outcomes. As the number of trials grows the probability of outcome will be more accurate.

Q6. What kind of object can be shuffled by using random.shuffle?

**Ans:** list, string, dictionary can be shuffled using random.shuffle.

Q7. Describe the math package's general categories of functions.

**Ans:** Numeric functions, logarithmic functions, power functions, trigonometric functions, angular functions, special functions are the category of math functions.

Q8. What is the relationship between exponentiation and logarithms?

**Ans:** Logarithmic functions and exponential functions are inverses of each other. That is, they undo each other.

Q9. What are the three logarithmic functions that Python supports?

**Ans:** log – for natural logarithm, **log2(a) – logarithm base 2 of a, log10(a) – logarithm base 10 of a.**