Answers for all Questions:

1. The likelihood that something will occur is known as probability. The event will never occur if the probability is zero. It will undoubtedly occur if it is 1. Additionally, the event has a 0.5 chance of occurring.
2. There are six possible outcomes (numbers 1 through 6) and only one favorable outcome (rolling a 3). Thus, the likelihood is 1/6.
3. Mean and Median and Mode
4. To list and explain a dataset's primary characteristics, such as its average or spread.
5. The difference between the highest and lowest values is called range. 100 - 60 = 40 in this case.
6. Variance has a square unit, such as square meters, since it is the average of squared deviations from the mean. The standard deviation is in the same unit as the data and is the square root of variance.
7. Models use probability to estimate the likelihood of an event. A model that determines whether an individual has cancer or does not, for instance, determines the likelihood that it belongs in the spam group.
8. When there are outliers or extreme values in the data, use the median. For instance, because the mean can be skewed by extremely wealthy individuals, median income is preferable to mean.
9. Data exploration is the process of closely examining the data to identify trends, identify mistakes, and determine how best to get it ready for analysis.
10. The case study demonstrates how intelligent techniques like machine learning and high-quality data can be used to identify patterns in illnesses, which can improve diagnosis and treatment outcomes.
11. Because some homes are very expensive and some are inexpensive, prices may differ significantly, leading to a high standard deviation. It may not accurately reflect typical houses if you only look at the mean.
12. The plot displays the markers that change the most (fold change) and the significance of those changes (p-value). "Up-regulated" denotes an increase in activity, while "down-regulated" denotes a decrease.
13. Machine learning is the ability for computers to learn without being explicitly programmed.
14. Supervised, Unsupervised, and Reinforcement Learning.
15. Categories (Fail or Pass) are predicted by classification. Continuous values, such as prices, are predicted by regression.
16. To identify hidden groups or patterns in data without any labeled responses.
17. PCA means Principal Component Analysis. It helps reduce data dimensions while keeping important information.
18. Conventional programming generates outputs from inputs using rules. Machine learning learns the rules on its own by using data (inputs and outputs).
19. Machines learn by observing numerous examples, much like a child learns the appearance of a cat by seeing numerous cats.

20. An agent is a decision-maker or learner that gains knowledge by acting in a way that results in rewards or penalties.
21. Supervised: Logistic and Linear Regression. Unsupervised: K Means clustering and PCA.
22. Because jumbled or inaccurate data can cause the model to become confused and produce subpar results. The model may fail to learn or learn incorrect patterns if these steps are not completed correctly.
23. A false positive occurs when something positive is mistakenly classified as negative. You risk missing crucial messages, which is an issue.
24. Artificial Intelligence (AI) is the study of programming computers to carry out tasks that typically call for human intelligence.
25. ML is a part of AI, and DL is a part of ML.
26. Narrow AI, General AI, and Super AI. We only have Narrow AI today.
27. Logic and Knowledge Representation.
28. "Thinking Humanly" refers to AI's attempt to mimic human thought processes. "Acting Rationally" refers to AI's attempt to make the optimal choices regardless of human thought processes.
29. NLP is how computers understand and use human language. An example is chatbots.
30. Generative AI does more than just analyze data; it also produces original content, such as text or images. For instance, ChatGPT generates fresh text.
31. The AI will pick up and perpetuate biases if the training data contains unfair patterns, such as underrepresenting particular groups. A hiring AI might, for instance, unjustly turn away competent applicants from a particular group.
32. Because when lives are on the line, people must have faith in the AI. In order to prevent errors and guarantee equity, doctors need to comprehend the reasoning behind AI's decision.