1. **Lossless Channel: A lossless channel is a communication channel that can transmit information without any loss or distortion. It preserves the integrity of the input data and ensures that the output is an exact replica of the input.**
2. **Deterministic Channel: A deterministic channel is a channel where the output is completely determined by the input. There is a fixed mapping or function that relates each input symbol to a unique output symbol, without any randomness or uncertainty.**
3. **Noiseless Channel: A noiseless channel is a channel that does not introduce any errors, noise, or interference during the transmission process. It enables perfect and error-free transmission of information from the sender to the receiver.**
4. **Symmetric Channel: A symmetric channel is a channel where the error probabilities for different input symbols are the same. It means that all input symbols have an equal likelihood of being transmitted correctly, and the error probabilities are symmetric across different symbols.**
5. **Uniform Channel: A uniform channel is a channel where all possible output symbols have an equal probability of being received, regardless of the input symbol. The probabilities of different output symbols are evenly distributed.**
6. **Binary Channel: A binary channel is a channel that has two possible input symbols and two possible output symbols. It can be represented using a 2x2 channel matrix that specifies the probabilities of transmitting each input symbol to each output symbol.**
7. **Binary Symmetric Channel: A binary symmetric channel (BSC) is a specific type of binary channel where the error probability is the same for both input symbols. It means that the channel flips the input symbol with a fixed probability and leaves it unchanged with the complementary probability.**
8. **Binary Erasure Channel: A binary erasure channel (BEC) is a binary channel that can either transmit the input symbol correctly or erase it with a certain probability. The erasure symbol indicates that the transmitted symbol is lost or unavailable.**
9. **Cascaded Binary Channels: Cascaded binary channels refer to a scenario where multiple binary channels are connected or combined in series. The output of one channel becomes the input to the next, and the overall transmission characteristics depend on the combination and properties of these individual channels.**
10. **Discrete Memoryless Source: A discrete memoryless source (DMS) is a source that generates a sequence of discrete symbols, where each symbol is statistically independent of the previous symbols. It does not have any memory or dependence on past symbols.**
11. **Priori Entropy: The priori entropy is the entropy or uncertainty associated with the input source before any specific outcome is observed. It quantifies the average amount of information contained in each symbol of the source before any further knowledge is gained.**
12. **Post Priori Entropy: The post priori entropy, also known as the conditional entropy, is the entropy or uncertainty associated with the input source given some observed outcome or information. It quantifies the average amount of information contained in each symbol of the source after the observation of specific events or conditions.**
13. **Equivocation: Equivocation is a measure of the remaining uncertainty or lack of information about the source after receiving some additional information. It represents the residual entropy or uncertainty that remains even after taking into account the observed outcomes or conditions.**
14. **Bayes' Rule: Bayes' Rule, also known as Bayes' theorem, is a fundamental principle in probability theory that allows for the calculation of conditional probabilities. It relates the probability of an event or hypothesis given certain evidence to the probabilities of the evidence given the event or hypothesis. It is widely used for inference and updating probabilities based on new information.**