Modulation

1. **Amplitude Shift Keying (ASK) - (a):**
    - Modulation: In ASK, the amplitude of the carrier signal is varied according to the digital data. A high amplitude represents a binary '1' and a low (or zero) amplitude represents a binary '0.'
    - Demodulation: The demodulator detects the presence or absence of the carrier signal's amplitude to determine the binary state. It uses an envelope detector to extract the signal's amplitude variations.
2. **Frequency Shift Keying (FSK) - (b):**
    - Modulation: In FSK, the frequency of the carrier signal is varied. One frequency represents a binary '1' and another frequency represents a binary '0'
    - Demodulation: The demodulator uses a frequency discriminator or a phase-locked loop (PLL) to distinguish between the different frequencies and reconstruct the original binary data.
3. **Phase Shift Keying (PSK) - (c):**
    - Modulation: In PSK, the phase of the carrier signal is shifted. For example, a 0-degree phase shift might represent a binary '0' and a 180-degree phase shift might represent a binary '1.'
    - Demodulation: The demodulator detects phase shifts in the received signal. This can be done using a phase detector which compares the phase of the received signal with a reference signal.

Demodulation

- **ASK Demodulation:**
    - The demodulator receives the modulated signal and passes it through an envelope detector which extracts the amplitude variations. These variations are then compared to a threshold to determine whether the signal represents a '1' or a '0.'
- **FSK Demodulation:**
    - The demodulator uses a frequency discriminator to detect the different frequencies. Each frequency corresponds to a binary value, which is then decoded to reconstruct the original digital data.
- **PSK Demodulation:**
    - The demodulator uses a phase detector to detect changes in the phase of the carrier signal. By comparing the phase of the received signal to a reference signal, the demodulator can determine the binary value based on the phase shifts.