Title:

Techniques of Modulation: Pulse Amplitude Modulation, Pulse Width Modulation with Mixed Signal

Theory:

Modulation is a process of changing the characteristics of the wave to be transmitted by superimposing the message signal on the high-frequency signal. The modulation technique aims at adapting the frequency band of the informative signal to that of the transmission channel. Pulse-amplitude modulation (PAM) is a form of signal modulation where the message information is encoded in the amplitude of a series of signal pulses. It is an analog pulse modulation scheme in which the amplitudes of a train of carrier pulses are varied according to the sample value of the message signal.

Pulse-width modulation (PWM) is a modulation process or technique used in most communication systems for encoding the amplitude of a signal right into a pulse width or duration of another signal, usually a carrier signal, for transmission.
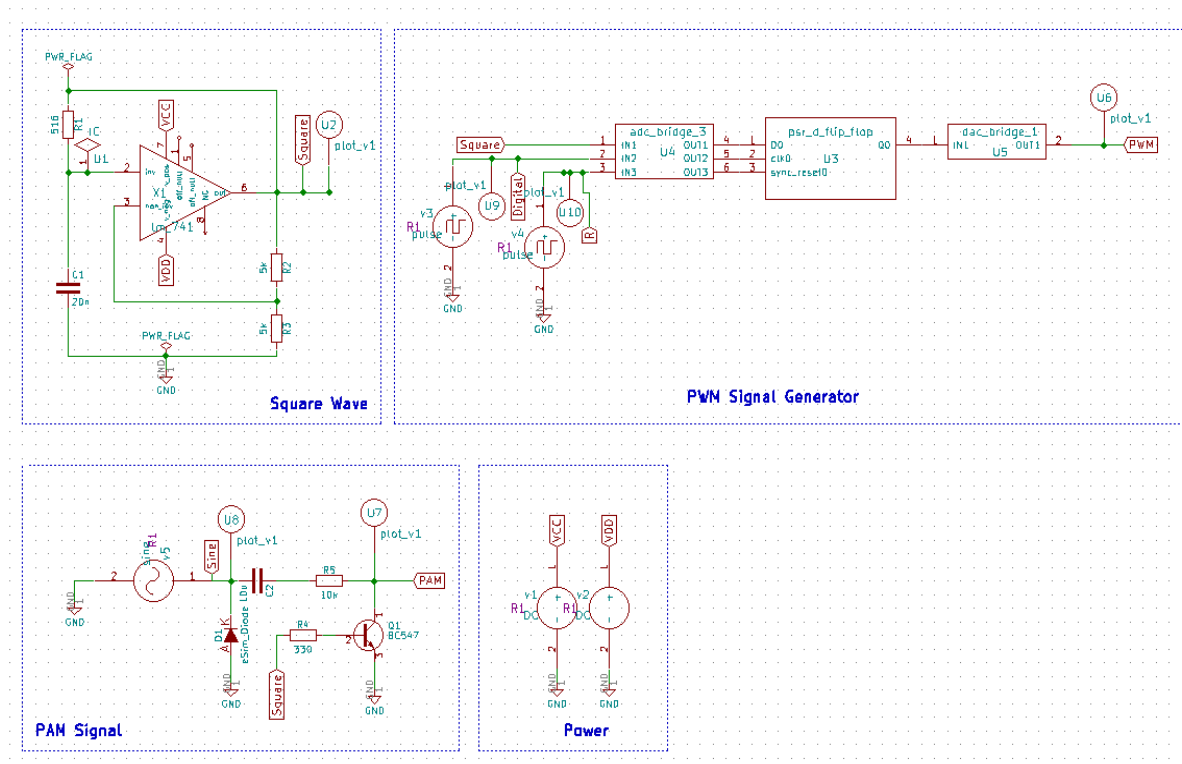
Schematic Diagram:

Fig 1: PAM & PWM Generation Circuit Diagram

Results: Simulation Plots

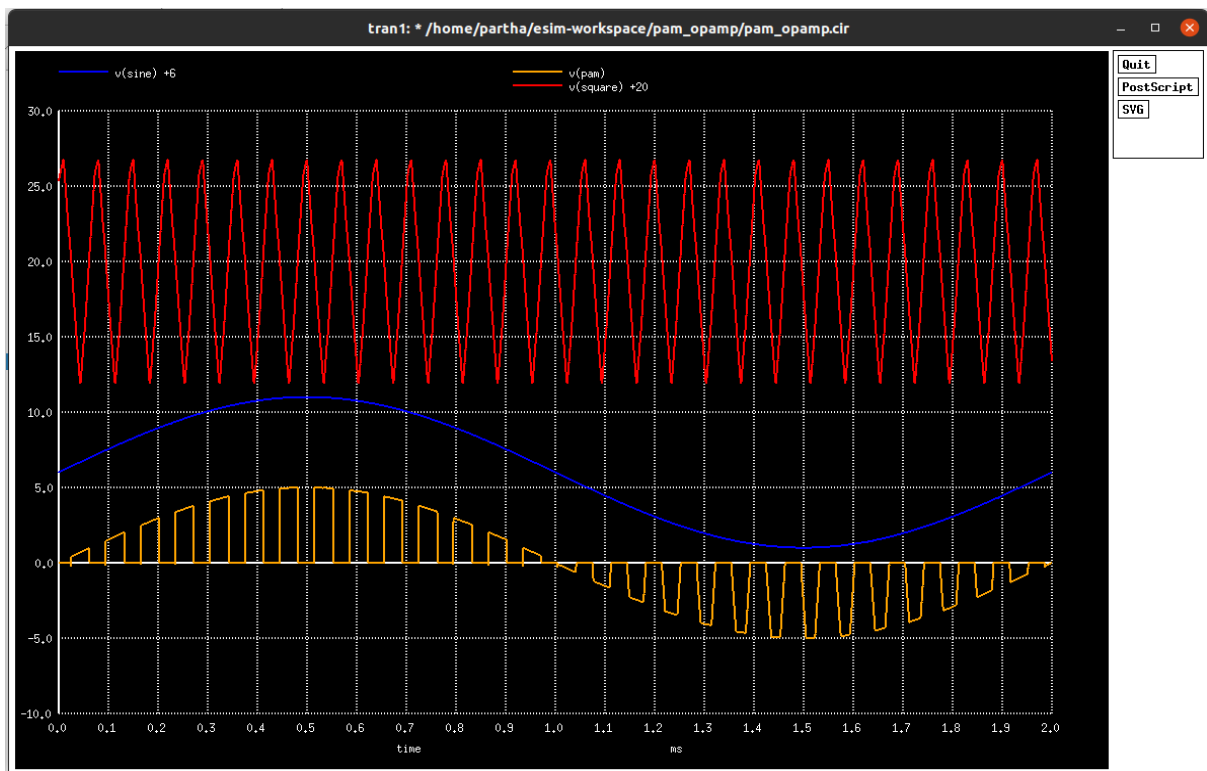1. Output (Pulse Amplitude Modulation)

Fig 2: PAM Signal Output Plot

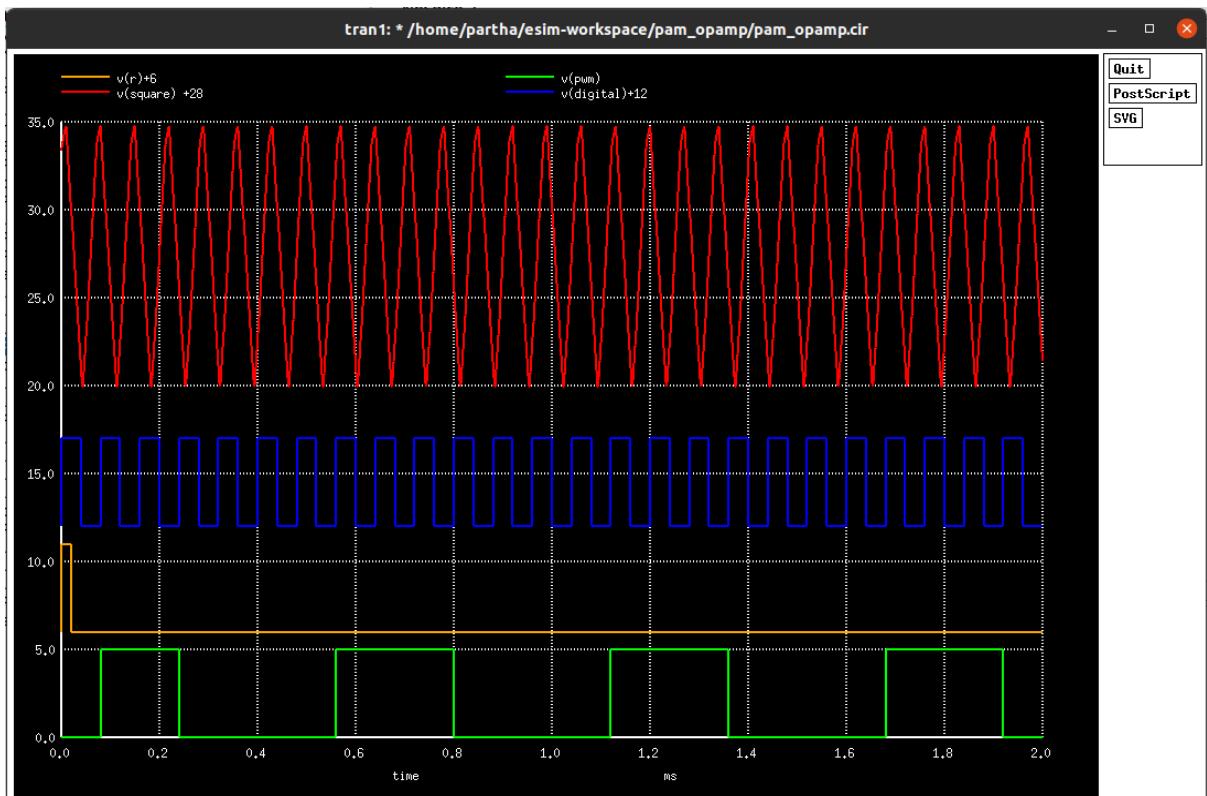2. Output (Pulse Width Modulation)

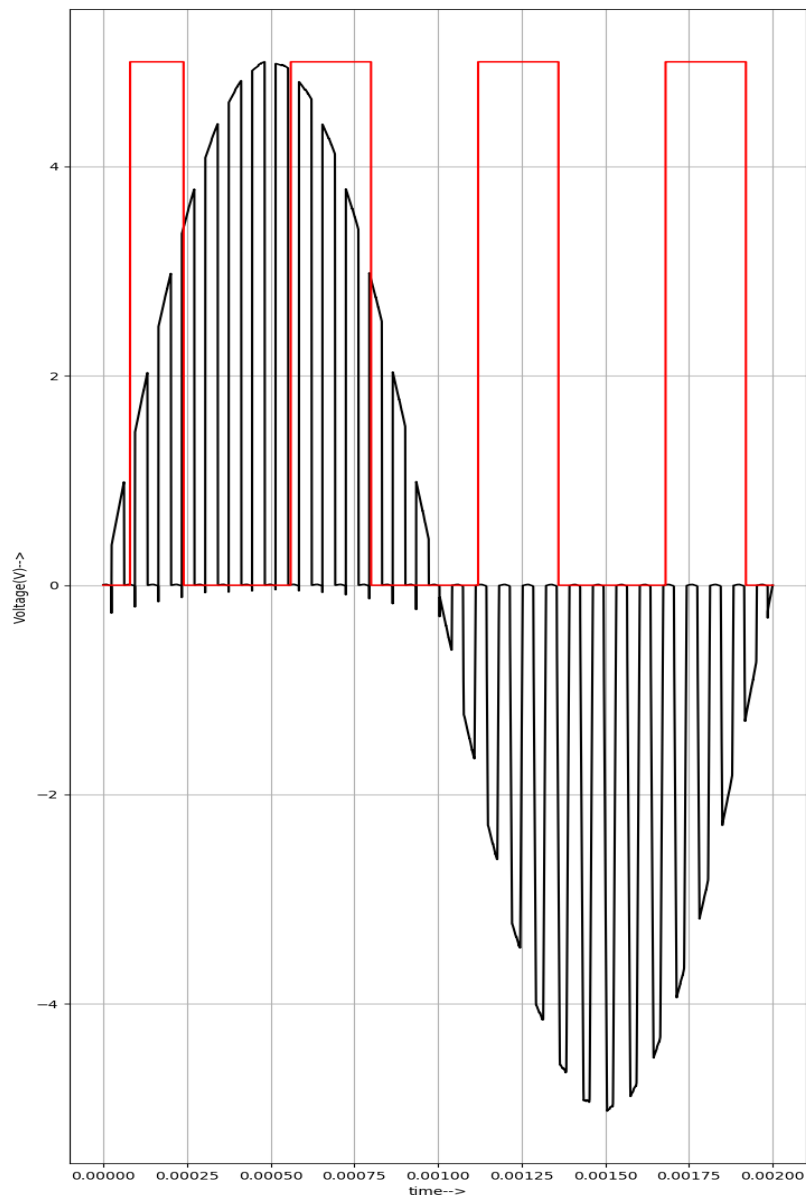Fig 3: PWM Signal Output Plot

3. Python Plot

Fig 4: Python Plot

Conclusion:

Thus, Pulse Amplitude Modulation & Pulse Width Modulation signals are generated in eSim and the appropriate waveforms are obtained.

Reference:

1. https://www.ijeat.org/wp-content/uploads/papers/v7i2/B5251127217.pdf