

5. (a) Design an adder circuit using an op-amp to get the output expression as $V_{out} = -(V_1 + 100V_2 + 50V_3)$. (5)
- (b) Explain the working of square wave generator using op-amp. Draw the waveform. (5)
- (c) Design a Sawtooth wave generator for 10 V peak and frequency of 200 Hz. Assume $V_i = 2\text{ V}$ and $V_{ref} = 10\text{ V}$. (5)
6. (a) Design a 555 timer based square wave generator to produce a symmetrical square wave of 2 KHz, if $V_{cc} = 12\text{ V}$ draw the output voltage across capacitor. (5)
- (b) What is comparator? Write the comparator characteristics. (5)
- (c) Write in details the formation of Hysteresis in Schmitt trigger circuit. (5)
7. (a) Design a wide band pass filter for $f_L = 100\text{ Hz}$, $f_H = 1\text{ KHz}$ and passband gain equal to 4. Also calculate its quality factor. (7)
- (b) Explain the following filters with characteristic curve : Notch filter and All pass filter. (8)
8. (a) Explain the operation of a regulated power supply. What is line and load regulation. (6)
- (b) Compare the switching and series type of regulator. (4)
- (c) Explain the R/2R ladder type DAC. (5)
9. (a) Draw the circuit of a log amplifier using two op-amp and explain its operation. (5)
- (b) Set up an analog computer simulation circuit to generate $10 \sin 3t$. (5)
- (c) What is PLL? What are the building blocks of a PLL? Write its different applications. (5)