Subject: Principles of Electronics Engineering

Tutorial-2

1. An amplifier has a gain of 50dB. Bandwidth of 250KHz, distortion of 12%, input impedance of 30KΩ and an output impedance of 2KΩ. If the voltage series negative feedback of 2.9% is given to this amplifier, calculate the gain, input impedance, output impedance, bandwidth and distortion of the amplifier with negative feedback.

2. In the voltage follower circuit, op amp used is ideal in all respects, except it has a finite gain, A. Determine v_o/v_{in}. If A is equal to 1000, calculate the error of the gain from that of the voltage follower with an ideal op amp.

3. Draw the summer circuits, using two ideal op amps, and calculate the different resistor values to obtain a) $v_o = 2v_1-4v_2+6v_3$ b) $v_o = v_1+3v_2+5v_3-7v_4-9v_5-11v_6$, where v_1,v_2,v_3,v_4,v_5 and v_6 are the available inputs.

4. The output signal of an op amp with a slew rate of 2.5V/μs, has a peak to peak value of 18V. Find the maximum frequency for undistorted output voltage.

5. An op amp has a differential gain of 2×10^4 and a CMRR of 86dB. Determine the output, if the differential input is 10μV and the common mode input is 10mV.

6. In the following circuits of figs, determine the output voltage, v_o. Assume the op amps to be ideal.