Mansoua University   Old 4th Year, First term
Faculty of Engineering   Electrical measuring and tests.
Electrical Engineering Department   Time Allowed 3 hours

Full Degree 60

Answer All Questions:

1- Design an RC ramp generator to give an output that peaks as 5V. The supply voltage is 15V and the load to be connected with the output is 100KΩ. The ramp is to be triggered by a negative pulse of 3V, PW=1ms and the space width of 1ms. The transistor is to be used is a normally ON and has h_{FEmin}=50.   (15)

2- Design the constant current generator for the ramp generator in question (1) to produce linear ramp. Then design the circuit for adjusting the ramp amplitude from 3 to 5V. (15)

3- Design a transistor bootstrap ramp generator to provide an output amplitude of 5V over a time period of 1ms. The ramp is to be trigged by a negative pulse of 3V, pulse width of 1ms and the space width of 1ms. The circuit supplies a load of 1KΩ and the ramp is to be linear within 2%. The supply voltage is ±15V, h_{FEmin}=100 for the transistor used.   (15)

4- Design a free running ramp generator with an output frequency of 1Khz and an output amplitude in the range 0 V to 8 V. Use 741 operational amplifier and a supply voltage of ±15 V.   (15)