Lista V EN2602 Prof Marcelo Perotoni, cap 9

OBS – Mostre o modelo de pequenos sinais para cada caso. Procure, sempre que possível, deduzir as fórmulas de impedancia e ganho usadas!!

17. Determine Z_i, Z_o and A_v for the network of Fig. 9.54 if $I_{DSS} = 10$ mA, $V_P = -4$ V, and $r_d = 40$ kΩ.

18. Determine Z_i, Z_o, and A_v for the network of Fig. 9.54 if $I_{DSS} = 12$ mA, $V_P = -6$ V, and $y_{os} = 40$ μS.

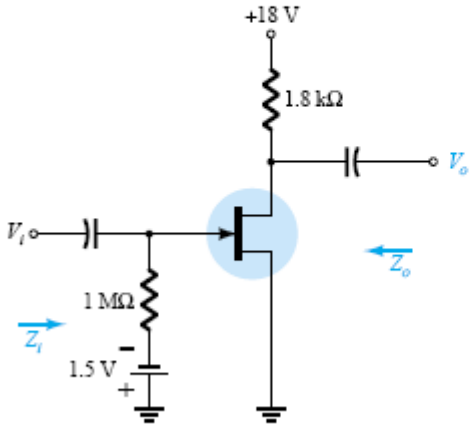


Figure 9.54 Fixed-bias amplifier for Problems 17 and 18

R:17. Zi=1M, Zo=1.72K Av=-5.375

R: 18. Zi=1M, Zo=1.68K Av=-5.04

20. Determine Z_i, Z_o, and A_v for the network of Fig. 9.56 if $I_{DSS} = 6$ mA, $V_P = -6$ V, and $y_{os} = 40$ μS.

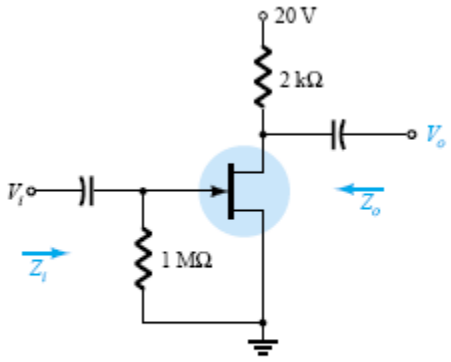


Figure 9.56 Self-bias configuration for Problems 20 and 47

R: Zi=1M, Zo=1852 Ohms Av=-3.7

23. Determine Z_i, Z_o, and V_o for the network of Fig. 9.57 if $V_i = 20$ mV.

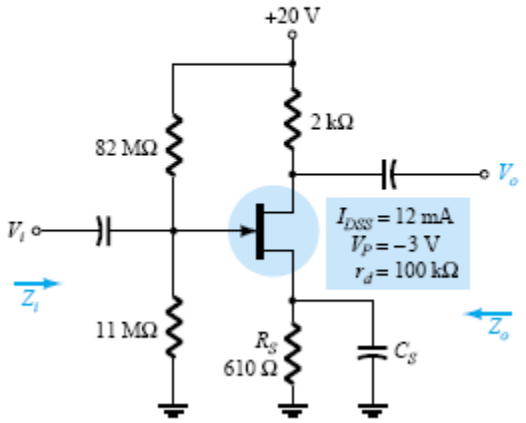
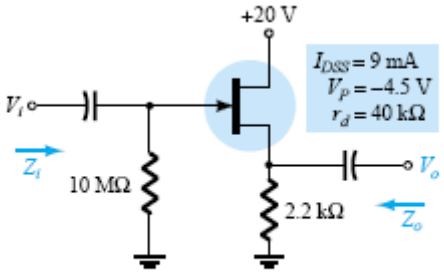


Figure 9.57 Problems 23–26 and 48

R: Id=5.46mA Zi=9.7M, Zo=2K Av= -10.94



27. Determine Z_i, Z_o, and A_v for the network of Fig. 9.58.

28. Repeat Problem 27 if $r_d = 20$ kΩ.

Figure 9.58 Problems 27 and 28

R: 27. Id=1.25mA Zi=10M, Zo=512.9 Av= 0.754

R: 28. Id=1.25mA Zi=10M, Zo=506.4 Av= 0.745

30. Determine Z_i, Z_o, and V_o for the network of Fig. 9.60 if $V_i = 0.1$ mV.

31. Repeat Problem 30 if $r_d = 25$ kΩ.

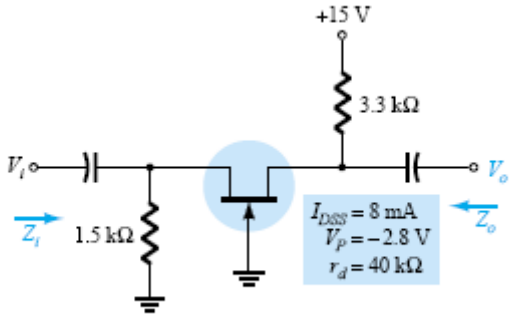


Figure 9.60 Problems 30, 31, and 49

R: 30. Id=1.1568mA Zi=356.3, Zo=3K3 Av= 7.06

R: 31 (aqui devo usar formulas AC exatas, rd bem menor). Zi=386.12, Zo=2.92K Av= 6.36

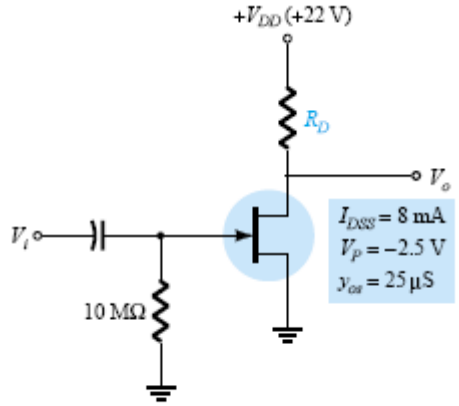


Figure 9.69 Problem 44

44. Design the fixed-bias network of Fig. 9.69 to have a gain of 8.

R: Rd=1290 Ohms com rd=40K e gm=gm0=64mS

45. Design the self-bias network of Fig. 9.70 to have a gain of 10. The device should be biased at $V_{GS_Q} = \frac{1}{3}V_P$.

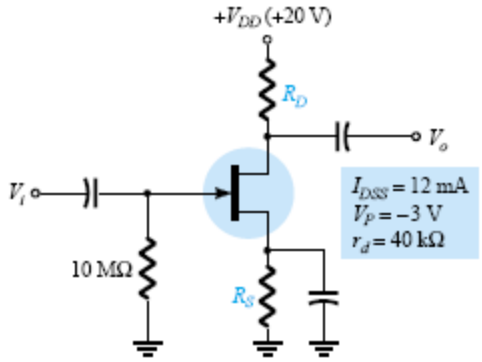


Figure 9.70 Problem 45

R: Id=5.33mA Rd=1970 Ohms e Rs=187.62 Ohms