|  |
| --- |
| No. 10 |
|  | • Menentukan re |
|  | • Mencari zi dan Av |
|  | • Menghitung Ai |
|  | Jawab : |
|  | a) IB = (VCC - VBE) / RB |
|  | = (22 – 0.7) / 330KΩ |
|  | = 21.3 / 330KΩ |
|  | = 65uA |
|  |  |
|  | IE = (β + 1) IB |
|  | = (80 + 1) 65uA |
|  | = 5.27mA |
|  |  |
|  | re = 26mV / IE |
|  | = 26mV / 5.27mA |
|  | = 4.93Ω |
|  |  |
|  | b) zi = RB // zb |
|  | = 330KΩ // (β (re + RE)) |
|  | = 330KΩ // (80(4.93Ω + 0.34KΩ)) |
|  | = 330KΩ // 27594Ω |
|  | = (330KΩ x 27594Ω) / (330KΩ + 27594Ω) |
|  | = 9106020KΩ / 357594Ω |
|  | = 26KΩ |
|  |  |
|  | Av = - RC / (re + RE) |
|  | = - 5.6KΩ / (4.93Ω + 0.34KΩ) |
|  | = - 16.24 |
|  |  |
|  | c) Ai = - (β x RB) / (RB + zb) |
|  | = - (80 x 330KΩ) / (330KΩ + 27954Ω) |
|  | = - 26400KΩ / 357594Ω |
|  | = - 73.8 |
|  |  |
|  |  |
|  | No. 11 |
|  | • Menentukan re dan βre |
|  | • Mencari zi dan zo |
|  | • Menghitung Ai dan Av |
|  | Jawab : |
|  | a) IB = (VCC - VBE) / RB |
|  | = (16 – 0.7) / 270KΩ |
|  | = 15.3 / 270KΩ |
|  | = 57uA |
|  |  |
|  | IE = (β + 1) IB |
|  | = (110 + 1) 57uA |
|  | = 6.33mA |
|  |  |
|  |  |
|  | re = 26mV / IE |
|  | = 26mV / 6.33mA |
|  | = 4.11Ω |
|  |  |
|  | b) zi = RB // zb |
|  | = 270KΩ // (β (re + RE)) |
|  | = 270KΩ // (110(4.11Ω + 2.7KΩ)) |
|  | = 270KΩ // 297KΩ |
|  | = (270KΩ x 297KΩ) / (270KΩ + 297KΩ) |
|  | = 80190MΩ / 567KΩ |
|  | = 141.43KΩ |
|  |  |
|  | zo = RE // re |
|  | = 2.7KΩ // 4.11Ω |
|  | = (2.7KΩ x 4.11Ω) / (2.7KΩ + 4.11Ω) |
|  | = 11097Ω / 2704.11Ω |
|  | = 4.103 |
|  |  |
|  |  |
|  | c) Av = RE / (RE + re) |
|  | = 2.7KΩ / (2.7KΩ + 4.11Ω) |
|  | = 2700Ω / 2704.11Ω |
|  | = 1 |
|  |  |
|  | Ai =- (β x RB) / (RB + zb) |
|  | = - (110 x 270KΩ) / (270KΩ + 297KΩ) |
|  | = - 29700KΩ / 567KΩ |
|  | = - 52.38 |
|  |  |
|  |  |
|  |  |
|  | No.12 |
|  | • Menentukan zi dan zo |
|  | • Mencari Av |
|  | • Menghitung Vo jika Vi=1mV |
|  | Jawab : |
|  | a) IB = (VCC - VBE) / RB |
|  | = (12 – 0.7) / 390KΩ |
|  | = 11.3 / 390KΩ |
|  | = 28uA |
|  |  |
|  | IE = (β + 1) IB |
|  | = (120 + 1) 28uA |
|  | = 3.39mA |
|  |  |
|  | re = 26mV / IE |
|  | = 26mV / 3.39mA |
|  | = 7.67Ω |
|  |  |
|  | zi = RB // zb |
|  | = 390KΩ // (β (re + RE)) |
|  | = 390KΩ // (120(7.67Ω + 5.6KΩ)) |
|  | = 390KΩ // 672KΩ |
|  | = (390KΩ x 672KΩ) / (390KΩ + 672KΩ) |
|  | = 262080MΩ / 1062KΩ |
|  | = 247KΩ |
|  |  |
|  | zo = RE // re |
|  | = 5.6KΩ // 7.67Ω |
|  | = (5.6KΩ x 7.67Ω) / (5.6KΩ + 7.67Ω) |
|  | = 42952Ω / 5607.67Ω |
|  | = 7.66 Ω |
|  |  |
|  | b) Av = RE / (RE + re) |
|  | = 5.6KΩ / (5.6KΩ + 7.67Ω) |
|  | = 5600Ω / 5607.67Ω |
|  | = 1 |
|  |  |
|  | c) Ai = Vo / Vi |
|  | Vo = Vi x Ai |
|  | = 1mV x 1 |
|  | = 1mV |
|  |  |
|  |  |
|  |  |
|  | No.13 |
|  | • Hitung IB dan IC |
|  | • Menentukan re |
|  | • Menentukan zi dan zo |
|  | • Mencari Av dan Ai |
|  | Jawab : |
|  | a) Rth = R1//R2 |
|  | = (56KΩ x 8.2KΩ) / (56KΩ + 8.2KΩ) |
|  | = 459.2MΩ / 64.2KΩ |
|  | = 7.2KΩ |
|  |  |
|  | IB = (VCC - VBE) / Rth |
|  | = (20 – 0.7) / 7.2KΩ |
|  | = 19.3 / 7.2KΩ |
|  | = 2.68uA |
|  |  |
|  | IC = β x IB |
|  | = 200 x 2.68uA |
|  | = 0.54mA |
|  |  |
|  | b) IE = (β + 1) IB |
|  | = (200 + 1) 2,68uA |
|  | = 0.54mA |
|  |  |
|  | re = 26mV / IE |
|  | = 26mV / 0.54mA |
|  | = 46.43Ω |
|  |  |
|  | c) zi = Rth // zb |
|  | = 7.2KΩ // (β (re + RE)) |
|  | = 7.2KΩ // (200(46.43Ω + 2KΩ)) |
|  | = 7.2KΩ // 409KΩ |
|  | = (7.2KΩ x 409KΩ) / (7.2KΩ + 409KΩ) |
|  | = 2944.8MΩ / 416.2KΩ |
|  | = 70.76KΩ |
|  |  |
|  | zo = RE // re |
|  | = 2KΩ // 46.43Ω |
|  | = (2KΩ x 46.43Ω) / (2KΩ + 46.43Ω) |
|  | = 92860Ω / 2046.43Ω |
|  | = 45.38 Ω |
|  |  |
|  | d) Av = RE / (RE + re) |
|  | = 2KΩ / (2KΩ + 46.43Ω) |
|  | = 2000Ω / 2046.43Ω |
|  | = 0.98 |
|  |  |
|  | Ai = - (β x Rth) / (Rth + zb) |
|  | = - (200 x 7.2KΩ) / (7.2KΩ + 409KΩ) |
|  | = - 1440KΩ / 416.2KΩ |
|  | = - 3.46 |
|  |  |
|  |  |
|  |  |
|  | No.14 |
|  | • Menentukan re |
|  | • Mencari zi dan zo |
|  | • Menghitung Av dan Ai |
|  | Jawab : |
|  |  |
|  | a) IE = (VEE – VBE) / RE |
|  | = (6 – 0.7) / 6.8KΩ |
|  | = 5.3 / 6.8KΩ |
|  | = 0.78mA |
|  |  |
|  | re = 26mV / IE |
|  | = 26mV / 0.78mA |
|  | = 33.3Ω |
|  |  |
|  | b) zi = RE // re |
|  | = 6.8KΩ // 33.3Ω |
|  | = (6.8KΩ x 33.3Ω) / (6.8KΩ + 33.3Ω) |
|  | = 226440Ω / 6833.3Ω |
|  | = 33.14Ω |
|  |  |
|  |  |
|  | zo = RC = 4.7KΩ |
|  |  |
|  | c) Av = RC / re |
|  | = 4.7KΩ / 33.3Ω |
|  | = 141.14 |
|  | Ai = -1 |
|  |  |
|  |  |
|  | No. 15 |
|  | • Menentukan Av dan Ai |
|  | Jawab : |
|  | a) IE = (VEE – VBE) / RE |
|  | = (5 – 0.7) / 3.9KΩ |
|  | = 4.3 / 3.9KΩ |
|  | = 1.1mA |
|  |  |
|  | re = 26mV / IE |
|  | = 26mV / 1.1mA |
|  | = 23.64Ω |
|  |  |
|  | Av = RC / re |
|  | = 3.6KΩ / 23.64Ω |
|  | = 152.28 |
|  |  |
|  | Ai = -1 |