Circuit Tech_Round 2_Novice (Answersheet)

1. Solution

Veff=12-9=3V

RT=150K

I=Veff/RT=20µA

2. Solution

Power as seen on wattmeter is 1.491W

Voltage=48V

As we know $P=V^2/R$

Therefore, R=1.545KΩ

As R=(1/R1) +(1/R2) +(1/R3) +R4

Therefore, R4=1K

3. Solution

BE1+BE2-KVL: 3=470x10° iy, + vy, + Vg, CE1-KVL: 10=4.7x10 ip, + Vo + Vo, CE2-KVL: 10=470 i,+ v,

Darlington Pair: i, =i,

From previous slide: v, =v,,, =07V

iy =340 u A ir; =0.340 mA (QI active) Ve, = 1.70V

igy =iy =(B +1)i, =0.343 mA

Assume Q2 Active: i., = iz, and v, 2V,,=0.7V iy = 5iz =50%0.343x107° =17.2 mA

CE2-KVL: 10=470i., +Vegy = Vo, =1.94V

Vep, =194V >V, =0.7V — Assumption correct

4.

ANS : 7.5V and −20.5V