

**American University of Sharjah**

**College of Engineering**

**Department of Computer Engineering**

**Embedded Systems (COE 410L)**

**HW2 Report**

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**Q1**

Ib Low = 3mA

Ib High = 16mA

Ic Low = B^2 \* Ib Low = 30^2 \* 3mA = 2.7A

Ic High = B^2 \* Ib High = 30^2 \* 16mA = 14.4A

Power\_Min = 2.7A \* 12V = **32.4W**

Power\_Max = 14.4A \* 12V = **172.8W**

Rb = (VGPIO – VBE1 – VBE2)/ IGPIO

Rb\_Min = (3.3V – 0.65V -0.65V)/3mA = **666.67 ohm**

Rb\_Max = (3.3V – 0.65V -0.65V)/16mA = **125 ohm**

**Q2)**

i)

import RPi.GPIO as GPIO

import time

GPIO.setmode(GPIO.BCM)

GPIO.setup(17, GPIO.OUT)

try:

while True:

time.sleep(16) //Delay 16 seconds for RED LED to be ON (NC)

GPIO.output(17, True) //Turn GPIO17 ON to switch GREEN LED On and RED Off

time.sleep(16) //Delay 16 seconds for GREEN LED to be ON (NO)

GPIO.output(17, False) //Turn GPIO17 Off to switch GREEN LED Off and RED On

time.sleep(12) //Delay 12 seconds for RED LED to be ON (NC)

GPIO.output(17, True) //Turn GPIO17 ON to switch GREEN LED On and RED Off

time.sleep(8) //Delay 8 seconds for GREEN LED to be ON (NO)

GPIO.output(17, False) //Turn GPIO17 Off to switch GREEN LED Off and RED On

ii)

Diagram

Description automatically generated

Diagram, schematic

Description automatically generated