Individual Performance Test [Spring 2020-21], Mid Term

Renewable Energy Technology Lab [A]

Marks: 20

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Group No:	**2**

Instructions:

a. There are four questions based on the design statement.
b. If your question says ID+15 then use last two digits of your ID before the hyphen and then add 15. For example, If ID: 18-78253-2, then use 53 and add 15. In this case, ID+15 = 53+15 = 68.
c. Rename your file name as your student ID.
d. Rename the PV array used in the simulation as your student ID.
e. Each screenshot should be taken in a manner which shows the current time in your laptop/desktops.
f. Copied/identical submissions will be graded as 0.
g. After finishing, convert the word file into PDF format and submit it in Microsoft teams (assigned assignment Section)

Design Statement: Design a PV Station with the following requirement.

- Maximum power (P_{max}) = **(ID+15) MW (approximate the power as close as possible)**
- Open Circuit Voltage (V_{oc})=**1.5 kV (1500 V)**
- PV panel model: **Kyocera Solar KC200GT**
- PV Cell Irradiance: **1000 W/m^2 and PV cell temperature: 25^{o}C**

Now based on the above criteria answer/fill out the below questions.

Q1. How many **PV panels are required in series and parallel**? **Show necessary calculation**. You can paste your notebook picture or type the calculation.

[5]

ID = 18-37400-1

Last 2 digit = 00

Maximum power (P_{max}) = (ID+15) MW

= (00 + 15) MW

= 15 MV

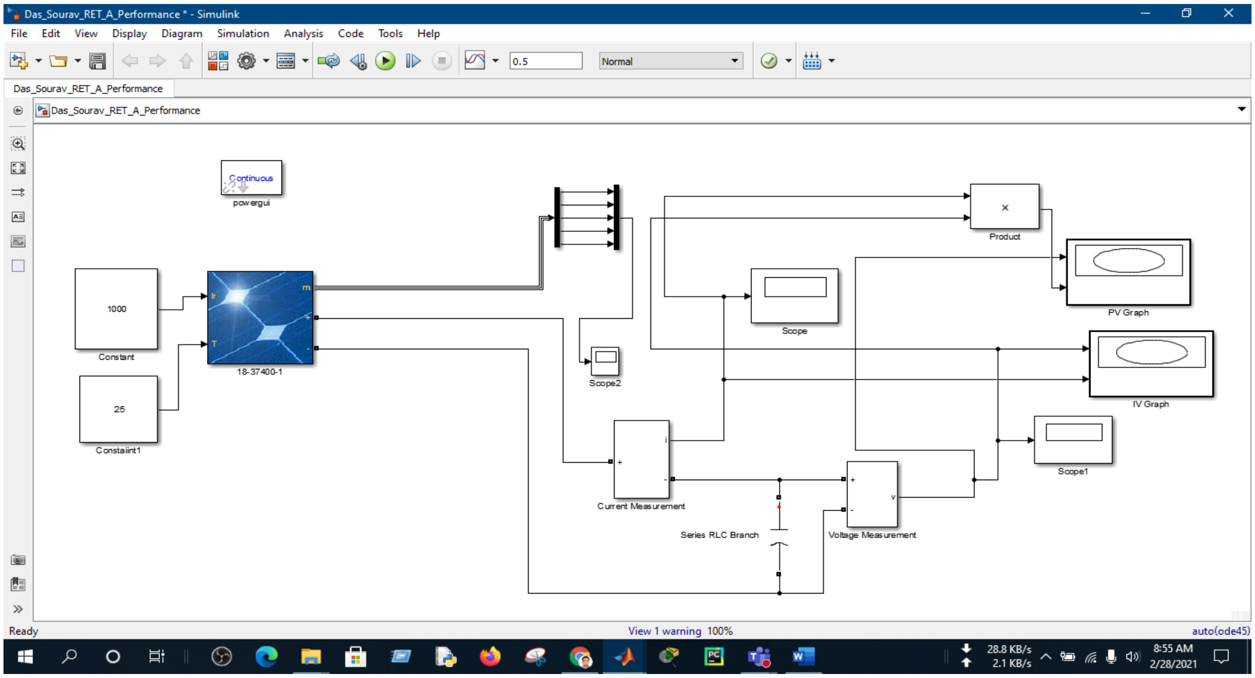
Open Circuit Voltage (V_{oc})=**1.5 kV (1500 V)**

So, Short Circuit current = Pmax/Voc = 15e6/1500= 10000 A

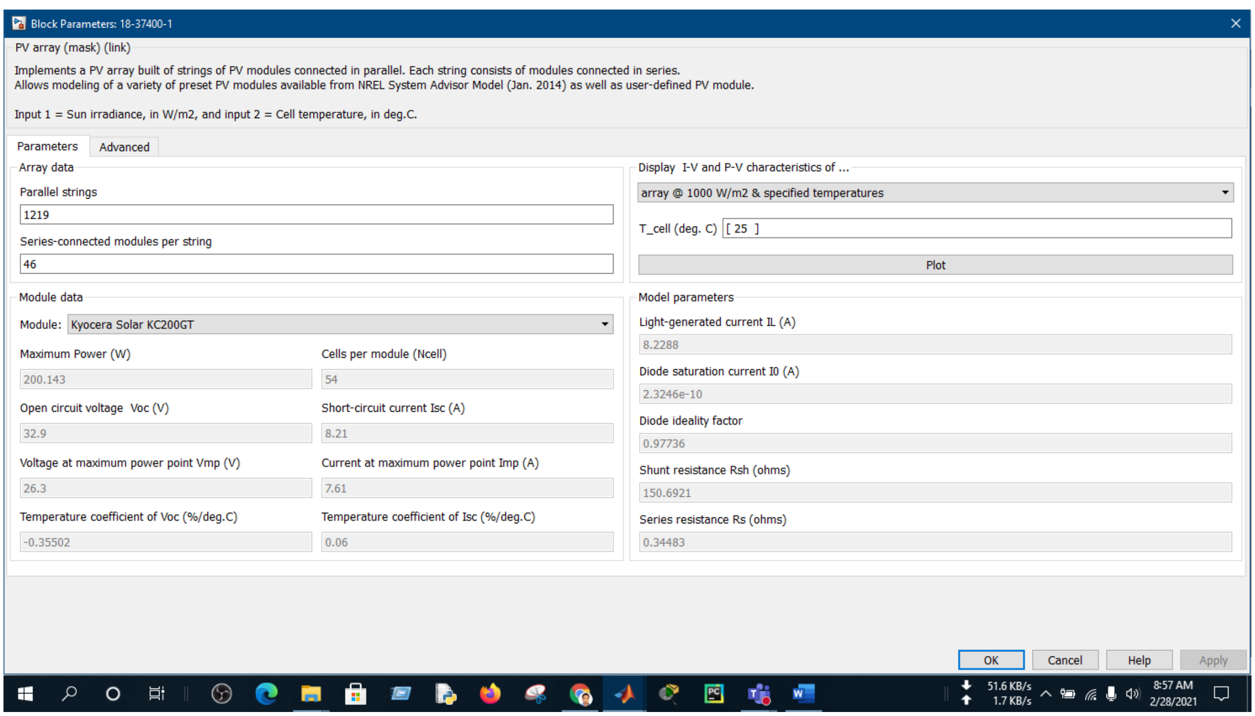
Now, PV panels are required in series = (1500/32.9) = 46

And, PV panels are required in parallel = (10000/8.21) = 1219

Q2. Paste the **snapshot of the layout of PV panel with capacitive load**. **[5]**

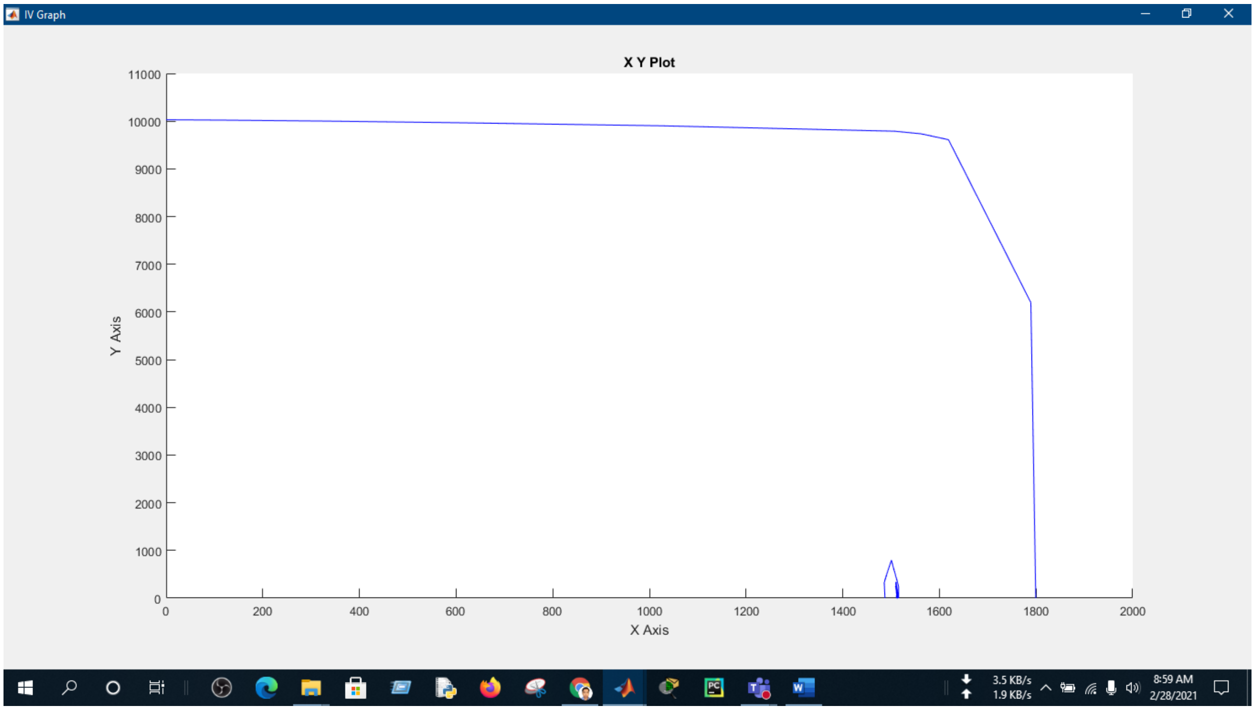


Q3. Paste the **block parameters snapshot** after double clicking on the PV module in Matlab Simulink for the designed PV station. **[5]**



Q4. Paste the **I-V and P-V characteristics graph**s snapshots for the above criteria. **[5]**

I-V:



P-V: