STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086

(For candidates admitted during the academic year 2016-17& thereafter)

SUBJECT CODE: 16VS/VM/SE16

B. Voc. DEGREE EXAMINATION, NOVEMBER 2021

SUSTAINABLE ENERGY MANAGEMENT

COURSE : MAJOR CORE

PAPER : SOLAR ENERGY

TIME : 3 Hours **MAX. MARKS: 100**

SECTION –A **(20 MARKS)**

Answer ALL Questions **(10 X 1 =10)**

I. CHOOSE THE CORRECT ANSWER

1. The maximum power that can be delivered from the module is the product of

a. short circuit current and short circuit voltage
b. open circuit voltage and open circuit current
c. current at maximum power and open circuit voltage
d. current and voltage at maximum power point

2. A solar cooker uses _____ energy from sun

a. Light b. Electric c. Both a & b d. Thermal

3. The source of energy of the sun is _____.

a. nuclear fission b. chemical c. nuclear fusion d. photoelectric effect

4. What is meant by the Standard Test Condition (STC)

a. Radiation: 1,024W/m^2 , temperature: 25°C, and Air Mass: 1.5
b. Radiation: 1,000W/m^2 , temperature: 25°C, and Air Mass: 1.5
c. Radiation: 1,000W/ m^2, temperature: 20°C, and Air Mass: 1.5
d. Radiation: 1,000W/m , temperature: 25°C, and Air Mass: 1.5

5. An battery is required on a PV system to Store

a. AC & DC b. AC power c. DC power d. AC / DC

II. FILL IN THE BLANKS

6. When solar modules are connected together in series, then the total voltage will _____.

7. The type of collector is used for high temperature systems is _____.

8. Solar radiation flux is usually measured with the help of a _____

9. The global radiation reaching a horizontal surface on the earth is given by _____.

10. A solar panel produces _____ power, an inverter converts it to _____.

III. ANSWER THE FOLLOWING **(5 X 2 =10)**

11. Two Personal Protective Equipment –

12. Unit of fill factor & maximum power

13. Example for commercial and non – commercial energy Sources

14. Instruments which measure beam radiations and diffuse radiations

15. It is important that all modules possess the same voltage – current characteristics in case of series connection – give reasons

SECTION – B (15 X 2 = 30)

Answer any TWO Questions

16. Classify the semiconductors with examples.

17. Define Black body Radiation. Classify the list of various applications of solar energy?

18. Write a note on different types of flat plate collectors with necessary diagram.

19. Elucidate the construction of a Solar cell and explain its various layers.

SECTION – C (25 X 2 = 50)

Answer any TWO Questions

20. Elucidate the construction, application along with the advantages and disadvantages of a solar pond.

21. Explain an experiment to compare the theoretical and experimental parameters when 2 panels are connected in parallel

22. Calculate the characteristics parameters of a solar panel under Sunlight and graphically review the results.

Time of the day	I_{SC} (mA)	V_{OC} (V)	Resistance for V_{oc} in ohms	Power P_{th} of the cell in mW
9.45 am	35	10.5	10000	
10.00 am	36	10.5	20000	
10.15 am	34	10	10000	
10.30 am	35	10.5	10000	
10.45 am	36	9	10000	

23. Draw the IV characteristics of a PV panel and elucidate the various parameters to be derived from the graph?

******