STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI- 86
(For candidates admitted during the academic year 2016 – 2017& thereafter)

SUBJECT CODE : 16VS/VM/PV26

B. Voc. DEGREE EXAMINATION, APRIL 2023
SUSTAINABLE ENERGY MANAGEMENT
SECOND SEMESTER

COURSE : MAJOR CORE
PAPER : FUNDAMENTALS OF PHOTOVOLTAICS
TIME : 6 HOURS **MAX. MARKS : 100**
(Theory: 50marks +Practical: 50 marks)

SECTION – A

ANSWER ALL QUESTIONS **(20 X 1 = 20)**

I. CHOOSE THE CORRECT ANSWER

1. Which of the following is not a semiconducting material?
   a. Silicon b. sodium chloride c. germanium d. gallium arsenide
2. Four solar panels are connected in parallel and each panel produces 12 volts. What should be the voltage rating of the battery?
   a. 12 volts b. 24 volts
   c. 48 Volts d. Independent of voltage rating
3. Which of the following is not solar PV design software tool?
   a. Helioscope b. PVSyst c.Bluesol d. Solaris
4. Fill factor of a photo voltaic cell is always _____.
   a. Less than 1 b. greater than 1 c. equal to 1 d. zero
5. How efficient is a solar panel per m^2?
   a. ~100 Watts/m^2 b. ~20 Watts/m^2
   c. ~200 Watts/m^2 d. ~10 Watts/m^2

II. FILL IN THE BLANKS

6. Under illumination of light, the photocurrent of a PV cell _____
7. A house uses 2 lights that consumes 40 watts and a fan that consumes 40 watt power. The required power of a solar panel is _____
8. A solar panel produce 6 volts, If we need 24 volts then four solar panels must be connected in _____
9. The solar panels delivers _____ power in shade than in direct sunlight.
10. The life time of a solar is about _____ years

III. SAY TRUE OR FALSE

11. PN junction is electrically neutral
12. Photoconductivity means the increase in the electrical conductivity of certain materials when they are exposed to light of sufficient energy

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13. The output from solar panel is alternating current
14. Aircraft could be run by solar power
15. Without battery, PV system does not work

IV. ANSWER IN A SENTENCE OR TWO

16. Draw dark characteristics of a solar cell.
17. Classify PV systems.
18. What does an inverter do?
19. Mention different types of solar panels.
20. Why are satellites in space powered by solar panels?

SECTION – B

Answer any SIX questions: **(6x3= 18)**

21. Distinguish between homogenous and heterogeneous PN junction.
22. List properties of semiconductor.
23. What is the role of invertors?
24. What are the main system components of photovoltaic system?
25. How do you predict performance of solar array?
26. Do solar panel work in the shade? Justify your answer.
27. What is building integrated PV system?
28. Compare building attached PV system with building integrated PV system.
29. Write a note on Sun's radiation on earth's surface.
30. Tell the common factors that affect the efficiency of a solar panel.

SECTION – C

Answer any TWO questions: **(2x6 = 12)**

31. Classify the photovoltaic systems. Explain each classification with an example.
32. Design solar PV system and estimate the cost for home lighting and other appliances.
33. Apply photovoltaic system to various applications.
34. Write a note on computer simulated experiment on energy consumption in a building.

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