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

B.Voc. DEGREE EXAMINATION, NOVEMBER 2023
SUSTAINABLE ENERGY MANAGEMENT
FIFTH SEMESTER

COURSE : MAJOR CORE
PAPER : SOFTWARE TOOLS FOR ENERGY ANALYSIS
SUBJECT CODE : 16VS/VM/ST56
TIME : 2 HOURS MAX.MARKS:50

SECTION – A

ANSWER ALL QUESTIONS: (20x1=20)

I. Choose the correct answer:

1. In PVSYST, what type of data analysis can be performed to assess the performance of a PV system over time?
   a) Financial modelling b) Weather forecasting
   c) Long-term degradation analysis d) Traffic flow analysis
2. When performing an economic evaluation of a PV system, what key factor is typically assessed to determine the system's financial viability?
   a) Solar panel color b) System voltage
   c) Return on investment d) Cable length
3. Which phase of the project lifecycle does RETScreen primarily focus on?
   a) Construction b) Operation and maintenance
   c) Identification and assessment d) Demolition
4. Energy efficiency measures studied in eQUEST can include:
   a) Identifying the best music playlists for productivity
   b) Evaluating the taste of cafeteria food
   c) Analysing strategies to reduce energy consumption, such as insulation and lighting upgrades
   d) Calculating the number of chairs in a meeting room
5. Real-time analysis of power generation using software is valuable for:
   a) Calculating the average temperature of a city
   b) Monitoring the stock market
   c) Tracking the performance of solar panels and energy production
   d) Playing video games

II. Fill in the blanks:

6. The building design related to _____ can be analysed using eQUEST software.
7. RETScreen is commonly used by professionals in the field of _____ to analyse the feasibility of renewable energy projects.
8. Analysis of solar array electrical behaviour using software helps in understanding the _____ and performance of photovoltaic systems.
9. PVSYST software is specialized in _____.
10. _____ is the type of software commonly used for the analysis of solar array electrical behaviour.

III. State whether True or False:

11. The evaluation of additional energy savings/production opportunities often involves assessing the potential for energy efficiency improvements.

12. Standalone PV systems are designed to operate independently from the grid making them suitable for remote locations.
13. An economic evaluation, specifically a 'Return on Investment study does not assess the financial viability of an investment in clean energy projects.
14. eQUEST is a valuable tool for evaluating and optimizing the efficiency of building designs.
15. In PVSYST, "PV" stands for Power Variation.

IV Answer in a sentence or two:

16. Mention the primary purpose of RETScreen when it comes to clean energy projects?
17. What is the significance of performing an economic evaluation of the PV system?
18. List the key components of a PV system that are addressed during the project design phase using PVSYST.
19. Name some industries/sectors where PVSYST is commonly used for the design and analysis of PV systems.
20. Explain the importance of simulating the installation of solar panels in a building using software.

SECTION – B

ANSWER ANY SIX QUESTIONS: (6x3=18)

21. What are the main objectives of conducting energy systems analysis?
22. Discuss the process of simulating the annual energy production of a solar PV system using PVSYST.
23. What methods and tools does RETScreen provide for comparing predicted energy performance with actual performance data?
24. What is eQUEST, and how does it contribute to the evaluation of building technologies?
25. Describe the main parameters and characteristics of a solar array that are typically analysed using software tools.
26. Define a stand-alone PV system. How does PVSYST handle the analysis of such systems, especially in remote or off-grid locations?
27. Discuss the importance of sensitivity analysis in RETScreen.
28. Define the concept of "Return on Investment" in the context of solar power projects.
29. How does the PVSYST software handle variations in solar irradiance and temperature throughout the year?
30. Explain how eQUEST features can assist users in estimating the potential energy and cost savings associated with the implementation of energy efficiency measures in existing buildings.

SECTION – C

ANSWER ANY TWO QUESTIONS: (2x6=12)

31. Explain the role of modelling and simulation in energy systems analysis. How can modelling tools assist in optimizing renewable energy systems?
32. Describe the process of modelling heating, ventilation, and air conditioning systems using eQUEST. How can HVAC system parameters be fine-tuned for energy savings in a building?
33. During data analysis in PVSYST, what are the key performance indicators that can help assess the efficiency and reliability of a PV system?
34. Explain the types of renewable energy systems that can be analysed using RETScreen. What are the primary input parameters for each type of system?

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