

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086  
(For candidates admitted during the academic year 2016-17& thereafter)

SUBJECT CODE: 16VS/VM/PA56

**B. Voc. DEGREE EXAMINATION, NOVEMBER 2021**  
**SUSTAINABLE ENERGY MANAGEMENT**

**COURSE : MAJOR CORE**

**PAPER : GREEN BUILDING & PASSIVE ARCHITECTURE**

**TIME : 3 Hours**

**MAX. MARKS: 100**

**SECTION – A**

**(20 marks)**

**Answer all the questions**

**(10 X 1 = 10)**

**I. CHOOSE THE CORRECT ANSWER**

1. Thermal systems used in industries
  - a. Photovoltaics and Solar water collectors
  - b. Solar air collectors and Photovoltaics
  - c. Solar air and water collectors
  - d. Photovoltaics
2. Example for thermal mass
  - a. Concrete
  - b. adobe
  - c. brick and water
  - d.all the above
3. What is freeze protection in a solar water heating system?
  - a) Ensures that the system is frozen
  - b) Prevents the operation of drainback system
  - c) Prevents damage to system due to freezing of transfer fluid
  - d) Ensures that the transfer fluid is frozen
4. Example for passive heating system
  - a. PV cells
  - b. Solar furnace
  - c. Active heating
  - d. Thermo mechanical
5. Which is not used in building passive heating cooling system
  - a. Walls
  - b. Roofs
  - c. Floors
  - d. AC

**II. FILL IN THE BLANKS**

6. Special building design is not necessary for \_\_\_\_\_ heating system
7. Medium temperature solar heating systems are \_\_\_\_\_ ° to \_\_\_\_\_ °
8. Solar radiation directly entering and heating living spaces, such as south-facing windows that admit heat from the winter sun and warm the room's air is called \_\_\_\_\_
9. The building \_\_\_\_\_ determines the amount of radiation it receives
10. Day lighting is a practice of placing windows openings, reflective surfaces to provide \_\_\_\_\_.

**Answer all the questions**

**III. ANSWER THE FOLLOWING IN ONE OR TWO LINES**

11. Define zero energy building.
12. Write any two benefits of green building.
13. Define R – Value
14. Define U – Value
15. Mention any two advantages of a heat pump.

**SECTION – B**

**Answer any TWO questions. (15 X 2 = 30)**

16. Discuss about typical energy flow in a building and brief the heat losses in a building
17. Elucidate different solar domestic hot water system with suitable diagram.
18. Discuss the advantages and disadvantages of passive and active solar heaters with examples
19. Elaborate the various Passive Design Strategies

**SECTION – C**

**Answer any TWO questions. (25 X 2 = 50)**

20. Explain in detail about the green building rating systems in India.
21. Calculate the R value and U value for the wall element and comment on the same

S. No	Layer & Material	Thickness and conductivity	R value in K m <sup>2</sup> /W
1)	Red bricks	0.100 m 0.600 W/mK	
2)	Glass wool	0.120 m; 0.022 W/mK	
3)	Concrete blocks	0.100 m 0.18 W/mK	
4)	Paint	0.001 m 0.06 W/mK	

22. Discuss the estimation of internal and external loads in detail and discuss the economic and social benefits of green building.
23. Write a detailed note on the cooling load calculation. Differentiate the Zero energy building and net zero energy building

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