

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

SUBJECT CODE: 16VS/VM/NM56

B.Voc. DEGREE EXAMINATION, NOVEMBER 2021

SUSTAINABLE ENERGY MANAGEMENT

COURSE : MAJOR CORE

PAPER : NOVEL MATERIALS FOR SUSTAINABILITY

TIME : 3 HOURS

MAX. MARKS: 100

SECTION – A

(20 MARKS)

ANSWER ALL QUESTIONS:

(10 X 1 =10)

I CHOOSE THE CORRECT ANSWER:

1. The CVD process can be plasma-supported that requires the temperature _____
a) 250-500°C b) 200-500°C c) 300-550°C d) up to 750°C
2. Wood is a composite material composed of _____
a) Lignin b) Collagen c) Hydroxyapatite d) Concrete
3. _____ materials change shape under exposure to light.
a) Thermoelectric b) Photovoltaic
c) Piezoelectric d) Photomechanical
4. σ in the figure of merit formula represents the _____
a) Seebeck coefficient b) Thermal conductivity
c) Electrical conductivity d) Temperature
5. _____ a light ,porous rock formed by consolidation of volcanic ash
a) Zeolites b) Tuff c) Sorbent d) MOF

II FILL IN THE BLANKS:

6. _____ could be used as a catalyst for the fuel cell.
7. DSSC is a _____ system.
8. The nanoparticles could easily be employed in biomedical research _____
9. The chemical reaction in which water is broken down into oxygen and hydrogen is _____
10. TiO₂ is chemically bound by a process called _____.

ANSWER ALL QUESTIONS:**(5 X 2 =10)****III ANSWER IN A SENTENCE:**

11. Revolutionary materials.
12. Xeriscaping
13. Give any two applications of novel materials
14. Three advantages of waste heat recovery process
15. Two applications of solar thermoelectric generator

SECTION - B**ANSWER ANY TWO QUESTIONS:****(2×15 = 30)**

16. Write a brief note on Carbon Nanotubes with its types.
17. a Define room index and calculate the room indices of the given rooms

S. No	Location	Length	Width	Mounting height
1	Room 1	25	8	5
2	Room 2	15	5	2

18. Define Sustainable Development with four root causes of Non-Sustainability.
19. Describe the working of an Organic LED with its advantages

SECTION – C**ANSWER ANY TWO QUESTIONS:****(2×25 =50)**

20. Define luminous efficacy. Calculate the luminous efficacy of different bulbs

S. No	Types of bulbs	Wattage of the bulb	Measured lumen value
1	Mercury	160	99
2	CFL	14	78
3	LED	9	160

21. Explain the waste water treatment in detail using Agricultural byproduct as a sorbent
22. a. Explain about Photocatalysis
 - b. Write a detailed note on the Dye-Sensitized Solar Cell with schematic diagram
23. a. Write a brief note on the process of making a rammed earth wall.
 - b. Discuss any 2 types of smart materials.

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