

**STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI- 86**  
**(For candidates admitted during the academic year 2016–17 & thereafter)**

**SUBJECT CODE : 16VS/VM/ET26**

**B. Voc. DEGREE EXAMINATION, APRIL 2019**  
**SUSTAINABLE ENERGY MANAGEMENT**  
**SECOND SEMESTER**

**COURSE : MAJOR CORE**

**PAPER : ENERGY CONVERSION TECHNIQUES (THEORY)**

**TIME : 6 HOURS**

**MAX. MARKS : 100**

**(Theory: 50marks +Practical: 50 marks)**

**SECTION – A**

**ANSWER ALL QUESTIONS**

**(20X1 = 20)**

**I. Choose the correct Answer:**

1. Thermoelectric refrigerator is working based on the principle of  
(a) Seebeck effect      (b) Peltier effect      (c) Thomson effect      (d) Thermodynamics
2. A storage device that converts chemical energy to electrical energy is  
(a) Battery      (b) Fuel cell      (c) Heat engine      (d) Dye sensitized solar cell
3. One which has high energy density is  
(a) Super capacitor      (b) Ultra capacitor      (c) Both a and b      (d) All the above
4. The anode component of zinc carbon battery is  
(a) zinc      (b) carbon      (c) both      (d) none of the above
5. The electricity can be generated from solar energy by  
(a) Thermal mode      (b) Photovoltaics      (c) Thermocouples      (d) All the above

**II. Fill in the Blanks:**

6. Dye sensitized solar cells convert \_\_\_\_\_ energy to \_\_\_\_\_ energy.
7. \_\_\_\_\_ synthesis that is induced or regulated by light.
8. Formula for conservation of energy is \_\_\_\_\_
9. \_\_\_\_\_ and \_\_\_\_\_ are the types of electrolysis.
10. Super capacitors are also known as \_\_\_\_\_.

**III. State true or false:**

11. Thermocouples are used to transform heat energy to electrical energy.
12. TEG devices are semiconductor based devices.
13. Electrolysis is splitting water in the presence of nuclear radiation.
14. The chemical energy in coal is converted to electrical energy.
15. Photocatalysis is the acceleration of photoreaction in the presence of a catalyst.

**IV. Answer in a sentence or Two:**

16. What is the law of conservation of energy?
17. Mention the different components of steam engine?
18. State the third law of thermodynamics.
19. Write any 2 disadvantages of thermoelectric refrigerator?
20. Mention any 2 advantages of thermoelectric generator?

**SECTION – B****Answer any SIX questions:****(6X3= 18)**

21. Explain the Peltier effect.
22. Give a brief account on the working of a Nickel-Cadmium battery.
23. Describe the working of a Lithium-ion battery.
24. Explain how the mechanical energy is stored in a flywheel?
25. Write a note on Bioreactor.
26. Discuss photocatalysis and its types.
27. Discuss the characteristics of supercapacitors.
28. Define Ferroelectricity and explain its applications.
29. What is Nernst effect generator.
30. Define Thermomagnetic effect and explain how it is used.

**SECTION – C****Answer any TWO questions:****(2X6 = 12)**

31. Explain the parameters governing the performance of a battery.
32. Describe the principle and working of Dye-Sensitized solar cells with neat diagram.
33. Explain the working of solar water pump.
34. Discuss the different types of energy storage systems.

\*\*\*\*\*