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Question Paper Code	12504
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**B.E./B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023**

Fifth Semester

**Electrical and Electronics Engineering**

**20EEEL503 - SOLAR AND WIND ENERGY SYSTEMS**

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

**PART-A (10 × 2 = 20 Marks)**

Answer ALL Questions

- |  | <i>Marks,<br/>K-Level, CO</i> |
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| 1. Compare the conventional and non-conventional energy sources.                   | <i>2,K2,CO1</i>               |
| 2. List the types of Renewable Energy (RE) sources.                                | <i>2,K1,CO1</i>               |
| 3. Interpret the effect of temperature on the performance of flat plate collector. | <i>2,K2,CO3</i>               |
| 4. What is meant by extraterrestrial radiation and terrestrial radiation?          | <i>2,K1,CO4</i>               |
| 5. Define solar pond.  | <i>2,K2,CO6</i>               |
| 6. Summarize the significance of maximum power point tracker in solar PV system.   | <i>2,K2,CO3</i>               |
| 7. Write the expression for power in the wind with necessary units.                | <i>2,K1,CO4</i>               |
| 8. Define drag force and lift force that impacts on the wind turbine.              | <i>2,K1,CO4</i>               |
| 9. How the wind energy conversion systems are classified?                          | <i>2,K1,CO5</i>               |
| 10. Enumerate some of the applications of solar PV systems.                        | <i>2,K1,CO5</i>               |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) Explain about the different types of renewable energy (RE) sources. *13,K2,CO1*
- OR**
- b) Summarize the present Indian and international energy scenario of conventional and RE sources. *13,K2,CO1*
12. a) Discuss the various methods of wind energy storage system with necessary diagram and also discuss the difficulty faced in maintaining efficient storage system for wind energy conversion. *13,K2,CO2*
- OR**
- b) Develop the solar-wind interconnected system with battery storage and explain the components in detail. *13,K3,CO2*

13. a) With neat I-V and V-P plots, explain the performance of solar photovoltaic system. *13,K2,CO3*

**OR**

- b) Explain the methods of maximum power point tracking that can be employed for solar photovoltaic system. *13,K2,CO3*

14. a) With necessary installation and generation data, discuss the growth in wind energy conversion system in India. *13,K2,CO4*

**OR**

- b) Describe the factors affecting the selection of site for installing new wind power plants. *13,K2,CO4*

15. a) With neat schematic diagram, explain the operation of different types of wind energy conversion system. *13,K2,CO5*

**OR**

- b) Demonstrate the construction and working of horizontal axis wind turbine with neat sketch. *13,K2,CO5*

**PART C (1 × 15 = 15 Marks)**

16. a) What are the types of solar radiation measuring instruments? Explain the working of sunshine recorder with a neat sketch. *15,K2,CO6*

**OR**

- b) Enumerate the different types of solar collectors with necessary diagram. *15,K2,CO6*