Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14EE2031** | **Duration :** | **3hrs** |
| **Sub. Name :** | **RENEWABLE ENERGY-I** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Briefly explain the mismatch losses of solar PV system. | C01 | 10 |
| b. | Discuss the photovoltaic effect on indirect band gap material. Mention the advantage of direct band gap semiconductor. | C01 | 10 |
| (OR) | | | | |
| 2. | a. | Draw and discuss the effect of temperature and radiation on the output of solar cell. | C01 | 15 |
| b. | Mention the different electrical parameters mentioned in the datasheet of solar panel. | C01 | 5 |
| 3. | a. | Make an inverter for a PV system with the output of 230V and 50 Hz and explain how the output can be controlled using sinusoidal pulse with modulation for less THD | C01 | 15 |
|  | b. | Draw the output characteristic of the solar cell to indicate the MPP. | C01 | 5 |
| (OR) | | | | |
| 4. | a. | Track the maximum power point of SAPV system using P&O algorithm and mention the drawback of the same algorithm. | C02 | 15 |
|  | b. | Mention the role of charge controller in the SAPV system. | C02 | 5 |
| 5. | a. | Discuss the operation of full wave rectifier for the delay angle 90° with suitable waveforms. | C02 | 15 |
|  | b. | Discuss the need of energy storage devices in SAPV system. | C02 | 5 |
| (OR) | | | | |
| 6. | a. | Track the MPP at rapidly varying environmental condition using incremental conductance algorithm and mention its limitation. | C02 | 15 |
|  | b. | Draw and explain the operation of SAPV system with MPPT. | C02 | 5 |
| 7. |  | Design a complete SAPV system for supplying the peak load of 900W and 3500Whr. | C02 | 20 |
| (OR) | | | | |
| 8. | a. | Draw and explain the operation of horizontal axis wind turbine . | C03 | 12 |
|  | b. | Derive the equation of output power generated from the kinetic energy of the wind turbine. | C03 | 8 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Discuss about the CP-λ curve of a wind turbine along with the different control methods used for better output. | C03 | 12 |
|  | b. | Draw and Explain the operation of grid connected wind energy system. | C02 | 8 |

ALL THE BEST