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 – April/May – 2017**

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| **Sub. Code:** | **14EE2031** | **Time :** | **3hrs** |
| **Sub. Name :** | **RENEWABLE ENERGY -I** | **Maximum marks :** | **100** |

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

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| --- | --- | --- | --- | --- |
| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | Draw and discuss the effect of temperature and radiation on the output of solar cell. | CO1 | 15 |
| b. | What is STC? List the different electrical parameters mentioned in the datasheet of solar panel. What will be the output of solar panel at STC if the panel efficiency is 18%? | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Discuss the effect of shading and mismatch on the output of solar cell. | CO1 | 15 |
| b. | Mention the different electrical parameters mentioned in the datasheet of solar panel. | CO1 | 5 |
| 3. | a. | Explain the maximum power point tracking of solar panel under varying environmental condition using P&O algorithm. | CO2 | 12 |
|  | b. | Construct a PV panel using solar cells of 1V, 0.5A. How many of these panels are required for 60V and 5A at the PV array output? | CO2 | 8 |
| (OR) | | | | |
| 4. | a. | Track the maximum power point of SAPV system using incremental conductance algorithm and mention the drawback of the same algorithm. | CO2 | 15 |
|  | b. | Mention the role of charge controller in the SAPV system. | CO2 | 5 |
| 5. | a. | Design a complete SAPV system for supplying the peak load of 900W and 3500Whr. | CO2 | 20 |
| (OR) | | | | |
| 6. | a. | Discuss the operation of full wave rectifier for R load with suitable waveforms. | CO2 | 10 |
|  | b. | Discuss the factors affectIng the performance of the battery. How to improve the life of battery? Discuss the various parameters associated with the battery. | CO2 | 10 |
| 7. | a. | Draw the different parts and explain the operation of horizontal axis wind turbine. | CO3 | 12 |
|  | b. | Discuss the two different control methods used for wind energy system. | CO3 | 8 |
| (OR) | | | | |
| 8. | a. | Draw and explain the operation of vertical axis wind turbine . | CO3 | 12 |
|  | b. | Derive the equation of output power generated from the kinetic energy of the wind turbine. | CO3 | 8 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Discuss about the CP-λ curve of a wind turbine along with the different control methods used for better output. | CO3 | 12 |
|  | b. | Draw and explain the operation of grid connected wind energy system. | CO2 | 8 |

ALL THE BEST