

IV B.Tech I Semester Supplementary Examinations, March - 2017**RENEWABLE ENERGY SOURCES AND SYSTEMS****(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 70***Question paper consists of Part-A and Part-B**Answer ALL sub questions from Part-A**Answer any THREE questions from Part-B*

PART-A (22 Marks)

1. a) Discuss briefly about the limitations of renewable energy sources. [4]
- b) Distinguish between flat plate and concentrating collectors. [4]
- c) Define photo voltaic effect. [4]
- d) List out the various components present in a wind turbine. [4]
- e) Classify the hydro electric power plants based on head. Suggest suitable turbine for different head applications. [3]
- f) What are the main applications of geothermal energy? [3]

PART-B (3x16 = 48 Marks)

2. a) What is solar power? Discuss the environmental impact of solar power in India. [8]
- b) How the solar radiation data is collected and what way it is helpful in solar energy conversion? [8]
3. a) With a neat sketch, explain the working of solar pond electric power plant. [8]
- b) Enumerate the different types of concentrating type collectors. [8]
4. a) List out various types of Maximum power point techniques. Explain about perturb and observe method. [8]
- b) Describe the different methods of energy storage system and explain the solar energy storage system. [8]
5. a) Prove that in case horizontal axis wind turbine maximum-power can be obtained when Exit velocity= 1/3 wind velocity. $P_{\max} = \frac{8}{27} \rho A V_i^3$ [8]
- b) State and briefly explain the factors that determine the out power form wind energy. [8]
6. a) Discuss the different types of turbines used for hydroelectric projects with diagram. [8]
- b) What is the source of tidal energy? What is the minimum tidal range required for the working of tidal plat. How much is the potential in tides. [8]
7. a) Explain the concept of wet steam geothermal system [8]
- b) Write short notes on regenerative fuel cell and list out its advantages [8]