

M.Tech. I-Semester Examinations, February-2007.

ENERGY CONVERSION SYSTEMS

(Common to Power Electronics and Electric Drives, Power Electronics, Electrical Power Engineering and Power Engineering and Energy Systems)

Time: 3 hours

Max. Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

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- 1.a) What is a Solar Cell? Explain its working and the process of Energy Conversion in it.
- b) Explain the following terms in convection with solar concentrators.
(i) Aperture Area (ii) Absorber Area (iii) Acceptance angle (iv) Optical Efficiency (v) Thermal Efficiency.
- c) Discuss the Economic feasibility of harnessing solar power.
- 2.a) Describe the working principle of MHD generation.
- b) Describe the constructional details and the working of practical MHD Generator.
- 3.a) Explain the principle of Wind Energy Conversion. Describe any one type of Wind Turbine commonly employed.
- b) Discuss the design considerations of a Wind Electric system. Discuss also the economic considerations in the above design.
4. Write a detailed note on the following:
(a) Ocean Thermal Energy Conversion Systems
(b) Wave Energy Conversion.
- 5.a) Explain the working of a Biomass Energy Conversion systems and its environmental effects.
- b) What is a Fuel Cell? Explain the working of a Fuel Cell. Mention the factors on which the amount of power obtained from such a fuel cell.
- 6.a) Explain clearly what you understand by Co-Generation.
- b) Discuss the Environmental effects of different Energy Conversion systems.
- 7.a) Explain the different types of Fuel Cells and their applications.
- b) Discuss the different types of Batteries employed for large power, applications. Discuss the precautions to be observed in such battery systems.
8. Write short notes on the following:
(a) Vertex motion of waves
(b) Application of superconducting materials in electrical equipment.
(c) Test specifications for p-v systems.

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