

17PS11E2 - DISTRIBUTED GENERATION

Instruction/week: 4 hrs.

Max. Sessional marks: 40

Univ. Exam: 3 hrs.

Univ. Exam marks: 60

UNIT-I

ENERGY CONVERSION: Introduction-principle of Renewable energy systems-grid-supplied electricity-Distributed generation-Technical and social implications

UNIT-II

SOLAR ENERGY: Overview of solar energy conversion methods-solar radiation components-collector-measurements-Estimation-solar water heating-calculation-types-analysis-economics-applications-solar thermal power generation

UNIT-III

DIRECT ENERGY CONVERSION(DEC):DEC devices-photo voltaic system-solar cells-cell efficiency-limitations-PV modules-Battery backup, system design-lighting and water pumping applications.

UNIT-IV

FUEL CELLS: Types- losses in fuel cell- applications; MHD generators-application of MHD generation.

WIND ENERGY: Characteristics-power extraction-types of wind machines-Dynamics matching-performance of wind generators-wind mills-applications-economics of wind power

UNIT-V

BIOFUELS: Classification- Biomass conversion process- applications; Ocean thermal energy conversion systems; Tidal and Wave power-applications; Micro and Mini hydel power, Hybrid energy systems-implementation-case study

TEXT BOOKS:

1. "Renewable energy sources" by Twidell J N&Weir AD' University Press, Cambridge
2. "Non conventional energy sources" by Rai G D, Khanna Publishers, New Delhi
3. "Solar energy-principle of thermal collection and storage" by Sukhatme,S.PTaTaMcGraw Hill
4. "Direct energy conversion" by Soo SL Prentice Hall Publication
5. "Fuel cell systems" by James Larminie, Andrew Dicks John Weily&Sons Ltd.

REFERENCES:

1. "Principles of solar engineering" by Kreith F and Kreider JF ,McGraw Hill