Exam.Code:0938
Sub. Code: 33794

2056

B.E. (Electrical and Electronics Engineering)

Eighth Semester

PE-EE-801: Non- Conventional Energy Resources and Grid Integration

Time allowed: 3 Hours Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Attempt the following:-

a) List four major factors that have contributed in the rapid growth of renewable energy sources?

b) Define Seeback effect and Peltier effect.

c) Define the working principle of a micro-turbine.

d) State the basic principle of Direct Energy Conversion (DEC).

e) Define MPPT? (5x2)

UNIT - I

II. **(a)** Explain the impact of partial shading on PV systems and how to mitigate it.

(b) Explain the working principle of a magneto hydrodynamic generator with a suitable schematic diagram. (5,5)

III. **(a)** Explain the principle of operation of reciprocating engine and its application in electricity generation With relevant diagram.

(b) Explain the principle of operation of wind-based generation systems (Horizontal Axis Wind Turbine). (5,5)

IV. Write a note on the following energy storage technologies:-

(a) Super capacitors

(b) Flywheel (5,5)

UNIT - II

V. **(a)** Describe the impact of high renewable energy penetration on system frequency and voltage stability. What is meant by "reduced inertia" in this context?

(b) Explain Centralized and Distributed Control techniques in a smart grid with distributed generation. (5,5)

P.T.O.

VI. (a) What is "islanding" in a microgrid, and why is it sometimes necessary?

(b) What are the protection coordination challenges posed by bidirectional power flow in microgrids? (5,5)

VII. Explain in detail the various types of Linear and Non-linear controllers used in energy conversion. (10)

x-x-x