Reg. No.										

MANIPAL
INSTITUTE OF TECHNOLOGY

A Constituent Unit of Manipal Academy of Higher Education, Manipal

II SEMESTER M.TECH (OPEN ELECTIVE)
END SEMESTER EXAMINATIONS, APRIL 2018
SUBJECT: RENEWABLE ENERGY TECHNOLOGY (MME 5286)
REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL the** questions.
- Missing data may be suitable assumed.

1A.	List the advantages of concentrating collectors over flat plate collectors.	**2.0**
1B.	Briefly discuss the main elements in a wind turbine. Prove that the power derived from the wind varies in the cubic order of the wind velocity.	**3.0**
1C.	Estimate the annual energy production from a horizontal axis wind turbine with a 20 m diameter operating in a wind regime with an average speed of 10 m/s. Assume that the wind turbine is operating at normal atmospheric conditions (ρ=1.225 kg/m^3) with 50 % efficiency.	**5.0**
2A.	Briefly discuss the disadvantages associated to tidal power generation system.	**2.0**
2B.	Sketch a diagram for the binary cycle geothermal power plant and identify the main components in the plant.	**3.0**
2C.	Draw a photovoltaic cell showing the main components of the cell, the circuit connection, and the direction of generated electric current. Provide an example of a doped material(s) used in photovoltaic cells.	**5.0**
3A.	List out the different manufacturing/synthesis methods for single crystal and thin films of silicon semiconductor.	**4.0**
3B.	Explain the chemical vapor deposition (CVD) process of thin film growth for poly-crystalline silicon with a suitable diagram.	**6.0**
4A.	Explain the *I-V* characteristics of a PV cell. Which factors need to be considered to maximize the power while designing a PV solar cell?	**5.0**
4B.	Explain in brief with a schematic, the working of a Proton-Exchange Membrane Cell (PEMC).	**5.0**
5A.	What are the advantages and the potential of tidal energy among renewable energy sources?	**2.0**
5B.	Briefly discuss the differences between closed cycle and open cycle OTEC.	**3.0**
5C.	Explain in brief with a neat diagram a floating type OTEC.	**3.0**
5D.	Why is that land based OTEC more costly in construction and has lower efficiency than floating type.	**2.0**