3 Hours)   **Marks: 80**

Note: -   1. Question No. 1 is compulsory.

2. Attempt any **three** questions out of remaining **five** questions.

3. Assume suitable data if necessary & justify the same.

4. Figures to the right indicate marks.

Qu.1		Attempt **any Four**.	
	(a)	Discuss the various losses occurs in solar cell.	[5]
	(b)	Discuss the effect of hot spots in Solar PV module	[5]
	(c)	Differentiate between Horizontal axis and Vertical axis wind turbine system.	[5]
	(d)	Draw and describe the static characteristics of fuel cell in brief	[5]
	(e)	Write a short note on tidal energy generation	[5]
	(f)	Write a short note on solar pond.	[5]
Qu.2	(a)	Explain any two types of concentrating collectors in brief. State its advantages	[10]
	(b)	Discuss the power electronics topologies for fuel cell along with neat diagram.	[10]
Qu.3	(a)	Illustrate the significance of MPPT in Solar PV system with neat block diagram. Explain perturb and observe MPPT algorithms with the help of suitable diagram.	[10]
	(b)	What are the different methods to use solar thermal energy? How Solar air heater is useful for energy generation? Explain	[10]
Qu.4	(a)	Enlist the topologies of wind energy system. Discuss the power converter topology used for double feed induction generators (DFIG) in wind turbines.	[10]
	(b)	Analyze the impact of change in solar radiation and temperature on solar PV characteristics with a neat diagram.	[10]
Qu.5	(a)	Discuss the types of stand-alone PV system configurations. Explain it in brief	[10]
	(b)	Explains the working of wind energy system along with its various components. Also discuss the wind power curve in detail	[10]
Qu.6	(a)	Draw the two junction model of solar cell. Also draw I-V and P-V characteristics of solar cell at STC. Analyze the impact of change in series and shunt resistance on the efficiency of solar cell.	[10]
	(b)	Explain the working principle of Ocean energy conversation system with neat diagram.	[10]

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