

TE Sem V C'scheme Summer 2025

3 Hours)

Marks: 80

13/06/25

Electrical

- 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]
