

Q.3. The specifications of the 2004 Toyota Prius with NiMH battery is given below

- 168 cells (28 modules)
- 201.6 V nominal voltage
- 6.5 Ah nominal capacity
- 28 hp (21 kW) output power
- 1300 W/kg specific power
- 46 Wh/kg specific energy.

- a. What is the energy rating of the battery module?
- b. If the battery can be discharged at 60A upto 30% determine the time of use if initial SOC =100%.
- c. If the battery is charged from 20% to 75%, determine the time for charging
- d. If the battery is modelled as R_{int} model, Calculate the efficiencies for a charge at current of 60A with $R_{int} = 0.04\Omega$ and discharge at current of 40A with $R_{int} = 0.15\Omega$. Calculate the drops across the R_{int} .

[10 Marks]