Assignment

Electric Machine Design

Questionnaires

Q1. A two-wheeler with drag coefficient of 0.51 and frontal projection area of 0.72 m2 has a maximum velocity of 130 kmph. Calculate the air resistance of the vehicle for the speed from 0 – 130 kmph (Take maximum speed increment of 5kmph). Also, plot the graph of aerodynamic force vs the speed.

Q2. For the following vehicles determine the drag resistance at the speed of 40 kmph.

1. Nissan Leaf
2. Tesla Model S Plaid
3. Tata Nexon
4. Toyota Prius
5. Ather 450X
6. Royal Enfield

Q3. For the following vehicle calculate the peak power and torque of the motor required.

Vehicle	Initial Acceleration	
	Speed (kmph)	Time (s)
Nissan Leaf	0 - 100	7.9 s
Tesla Model S Plaid	0 – 100	1.99
Tata Nexon EV	0 – 100	9.3
MG ZS EV	0 – 100	8.2
Hyundai Kona	0 – 100	6.6
Ather 450X	0 – 40	3.9
Royal Enfield	0 – 60	4.2
Bajaj Dominar	0 – 100	8.4
Hero Splendor	0 – 60	8

Q4. For the vehicle above plot the graph of – Traction force, aerodynamic force and rolling resistance against the vehicle speed. (Take top speed of the vehicle for speed range and take speed interval as 5kmph.)