Course outline How does an NPTEL online course work? Module 1 - Overview of Electric Vehicles in India Module 2 - Vehicle Dynamics Module 2 and 3 - Vehicle Dynamics and EV Subsystems Module 4 - Storage for EVs Module 4 - Storage for EVs (contd) Module 5 - Fundamentals of battery pack design Module 5 and 6 - Battery Pack Design, Motors and Controllers Module 6 - EV Motors and Controllers Lecture 58 - Torque Production - Part 1 Lecture 59 - Torque Production - Part 2 Lecture 60 - Torque Production - Part 3 Lecture 61 - Speed and Back EMF Lecture 62 - The d-q Equivalent circuit - Part 1 Lecture 63 - The d-q Equivalent circuit - Part 2 Lecture 64 - Field-oriented Control Lecture 65 - Three phase AC - Part 1 Lecture 66 - Three phase AC - Part 2 Lecture 67 - Thermal Design -Part 1 Lecture 68 - Thermal Design -Part 2 Lecture 69 - Thermal Design -Part 3 Lecture 70 - Engineering Considerations - Part 1 Lecture 71 - Engineering Considerations - Part 2 Lecture 72 - Future Frontiers Quiz: Week 8: Assignment 1 Quiz: Week 8: Assignment 2 Quiz: Week 8: Assignment 3 Quiz: Week 8: Assignment 4 Week 8: Feedback form: Electric Vehicles and Renewable Energy Week 8: Lecture notes Week 8: Solutions Module 7&8 - Battery Charging and Swapping, Analytics Module 9: Renewable Energy - Introduction Module 10: Renewable Energy - Solar and Wind Energy Module 11: Renewable Energy Live Session DOWNLOAD VIDEOS

Week 8: Assignment 1 The due date for submitting this assignment has passed. Due on 2021-09-22, 23:59 IST. As per our records you have not submitted this assignment. 1) What is the magnetic field strength needed to generate a torque of 19.6 Nm on a square-loop of 100 turns carrying 20 A at the angle 1 point shown in the picture (not to scale)? 14 cm ○ 1 T 0.5 T ○ 2 T 0.1 T No, the answer is incorrect. Score: 0 Accepted Answers: 1 T 2) If the direction of the current is along j axis and B is along i axis, what is the direction of force? 1 point Wire carrying current I N Along j Along i Upwards Downwards No, the answer is incorrect. Score: 0 Accepted Answers: Downwards 3) Which of the following is not a guaranteed way to increase the average torque produced on a loop carrying current? 1 point Increase the length of the loop Increase the number of turns Increase the torque angle Increase the breadth of the loop No, the answer is incorrect. Score: 0 Accepted Answers: Increase the torque angle 4) Which of the following current component(s) contribute to additional Reluctance Torque in a Surface Permanent Magnet Electric Motor? 1 point O ld O lq Both (a) and (b) None of the above No, the answer is incorrect. Score: 0 Accepted Answers: None of the above A vehicle powered by a PM-DC motor is cruising at 36 kmph, the applied voltage is 25V, the BEMF is 24V and the winding resistance is 20 mΩ. {Neglect steel losses. Make reasonable assumptions as needed} 5) How much current is the motor drawing? 1 point 0 50 A 120 A 01A None of the above No, the answer is incorrect. Score: 0 Accepted Answers: 50 A 6) What is the power delivered by the motor to the vehicle? 1 point 950 W 1250 W 1200 W None of the above No, the answer is incorrect. Score: 0 Accepted Answers: 1200 W 7) What is the efficiency of the motor? 1 point 0 104% 96% 85% None of the above No, the answer is incorrect. Score: 0 Accepted Answers: 8) If the applied voltage were to be increased by 1V, what will be the final steady-state speed of the vehicle? 1 point 37.50 Km/h 34.56 Km/h 36.00 Km/h None of the above No, the answer is incorrect. Score: 0

