

OR

- 6 a. Explain the constant v/f control of inductor motor for varying its torque-speed characteristics with relevant curves. Also depict the power electronic control for v/f control with the help of block diagram. (12 Marks)
- b. Explain the operation of classic half bridge converter used in SRM drives with the help of a circuit diagram. (08 Marks)

Module-4

- 7 a. Explain various configurations of electrical coupling device in the design of series hybrid electric drive trains. Also explain the operation of different bidirectional DC/DC converters used in it. (12 Marks)
- b. Explain the engine power design of a torque coupled hybrid electric drive train with relevant equations and curves. (08 Marks)

OR

- 8 a. Explain the following control strategies employed in a parallel hybrid electric drive train:
 (i) Max. SOC-of-PPS control strategy with a neat flow chart and speed-traction characteristics. (12 Marks)
 (ii) Engine on-off control strategy
- b. Explain the power rating design of traction motor in a series hybrid electric drive with relevant equations and curves. (08 Marks)

Module-5

- 9 a. List out and explain in detail various charging methods of battery used in EV and HEV. (12 Marks)
- b. Explain the following transformer less charger topology for battery with a neat circuit diagram:
 (i) Simple buck technology
 (ii) Neutral-point clamped topology (08 Marks)

OR

- 10 a. Explain the high frequency transformer based two-stage isolated charger topology for batteries used in EV and HEV with a neat circuit diagram. Also explain in detail about the design of various components of it. (12 Marks)
- b. Explain in detail about the design of z-circuit capacitor and inductor with relevant equations. (08 Marks)
