Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

II SEMESTER M.TECH. (OPEN ELECTIVE)

END SEMESTER EXAMINATIONS, JUNE/JULY 2017

SUBJECT: HYBRID & ELECTRIC VEHICLES [AAE 5282]

REVISED CREDIT SYSTEM

(24/06/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A.	List and discuss any 3 different types of battery parameters.	**5**
1B.	Sketch and explain the working of Zn-Air battery.	**2**
1C.	Explain the procedure for modeling the battery for its capacity.	**3**
2A.	Discuss the power flow layouts for series hybrid architecture.	**5**
2B.	List and explain the design of power control strategies for HEVs.	**3**
2C.	Explain the concept of fixed gearing.	**2**
3A.	Write a note on CAN bus for HEV's.	**2**
3B.	Discuss the basic Principles of Rule Based Control Methods for HEVs.	**3**
3C.	Discuss the working of Buck-Boost DC/DC converters.	**5**
4A.	Sketch and explain the basic working of hydrogen fuel cell with chemical reactions.	**5**
4B.	Sketch and explain the torque speed characteristic curve for electric motor.	**3**
4C.	Discuss the method of storing hydrogen using cryogenic cylinders.	**2**
5A.	Sketch and explain the principle of operation of Induction electric machines.	**5**
5B.	Compare fast charging to trickle charging.	**3**
5C.	Write a note on regenerative braking system.	**2**